SKYWAYS

MILITARY ★ CIVIL ★ COMMERCIAL AVIATION

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4 Flight

Alaska

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iet Jet Bomber: Tu-10 . . . page 13

OCT. 1951 25¢

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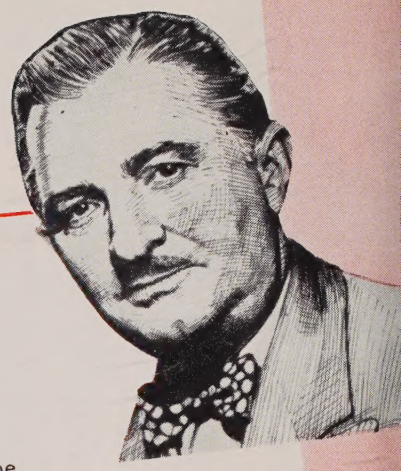

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J. W. Miller
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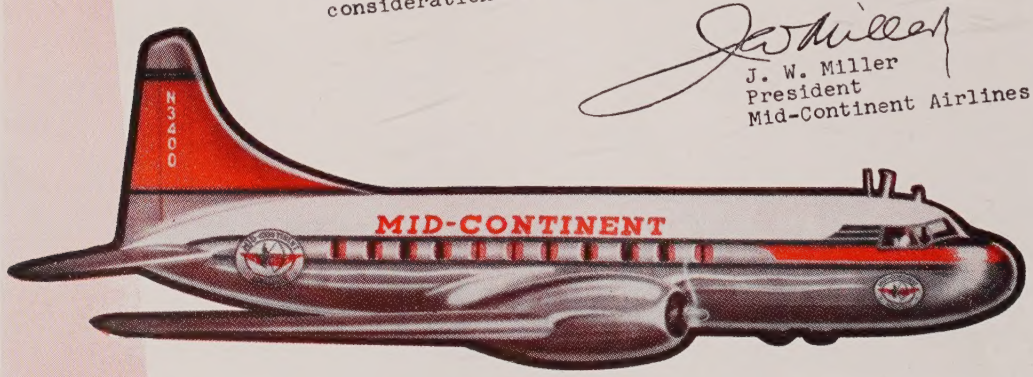

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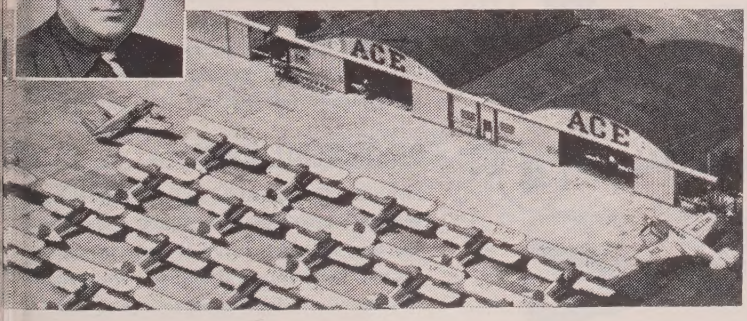

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Oil, grease, and tar deposits from leakage and runways deteriorate airplane tires. In these days of shortages, regular cleaning with soap and water will prolong the life of the tires on your plane.

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RPM AVIATION OIL

STANDARD OIL COMPANY OF CALIFORNIA

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The Lear ADF-12 points the way *automatically* to more than 3,243 places in the U.S. alone

In every city and just about every town of any consequence in the United States you will find a radio station on which you can home easily, positively, and automatically with your Lear ADF-12.

For example, your Lear ADF-12 automatic direction finder will steer you to 2,077 commercial broadcasting stations; 378 CAA low frequency radio ranges; 131 CAA radiobeacons; 150 marine radiobeacons; 161 CAA control towers (by homing on their carrier waves); 124 ILS compass locators (situated immediately adjacent to the runways of all major terminal airports; 110 Air Force low frequency radio ranges and towers; 85 Navy low frequency radio ranges and towers; 27 municipal and private low frequency radio ranges and towers.

Moreover, there are additional thousands of stations in Canada, Mexico, Alaska, Central and South America, and Europe on which you can home with your ADF-12.

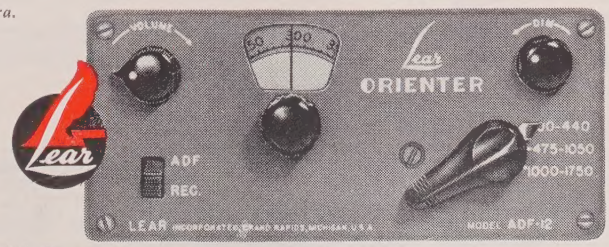
Navigating with your Lear ADF-12 is incredibly simple. Here is all you have to do to reach your destination: 1. Tune your Lear ADF-12 to the station you want to home on and instantaneously the azimuth indicator needle will point to the station. 2. Turn your airplane till the indicator needle points straight up. 3. Keep flying with the indicator needle in this position. When it swings around to the 180° position your station is directly below you.

The ADF-12 tells you not only *how* to get there—it tells you when you *are* there, eliminating all the usual worries about missed check points, low visibility, and finding the airport at the end of the trip when your gas is running low.

The Lear ADF-12 provides reception on three bands: 200-440 kc; 475-1050 kc; and 1000-1750 kc—thus making it a combined automatic direction finder, broadcast receiver, and radio range and communications receiver. It is extremely compact and light, yet rugged, powerful, and highly sensitive. It weighs less than 18 pounds—*less than the weight of three gallons of gas*—and can be easily installed in any type of plane from a Cub to a Connie. The price is only $695.* A special kit to simplify installation in your own particular plane is available at economical cost.

Write today for free illustrated booklet containing complete features and specifications of the Lear ADF-12.

**In U.S.A. and FOB Los Angeles. Excise tax extra.*



The ADF-12 contains provisions for furnishing modulation and power to Lear VHF transmitters

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SKYWAYS

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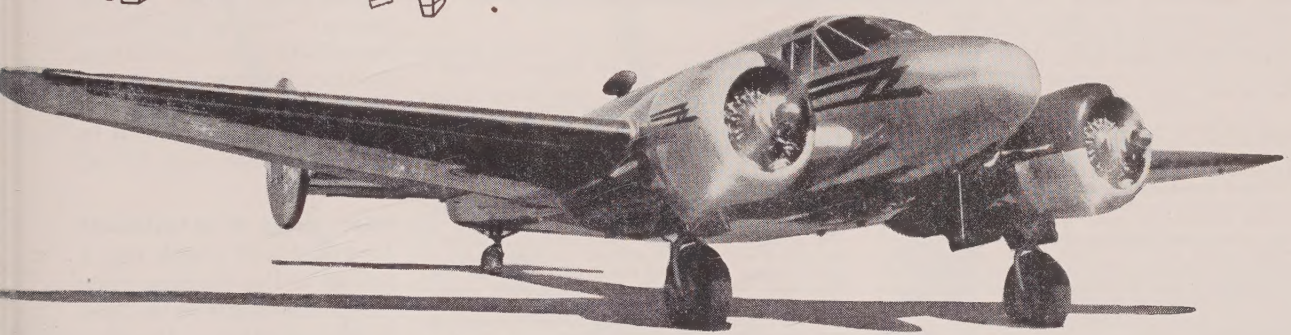
William Johnson finds it easy to do "double duty"

Mr. Johnson has an important desk job as General Manager of Charles B. Johnson, maker of sizing machines for textile mills. It's vital that he and other key men make field trips, too. The company's Twin-Engine Beech Executive Transport and Beechcraft Bonanza allow them to do *both* jobs. They clip travel time as much as 75%! Today, with mills filling government contracts, these Beechcrafts help keep production rolling. Example: A Johnson Sizer in a deep-south mill after long operation needed a replacement part. Thanks to Beechcraft "special delivery," the machine was idle just four hours!



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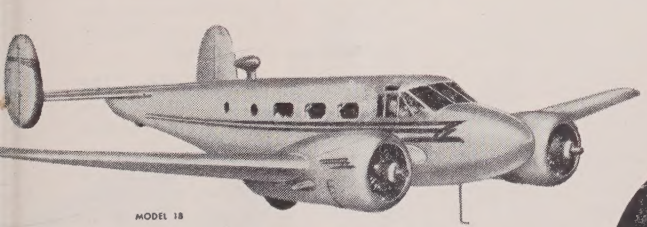

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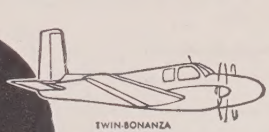
Beechcraft



BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

AIR YOUR VIEWS

Cooler Living

Gentlemen:
Here is a suggestion which may open up a new field for aviation. It is a plan for cooling entire cities in the summertime. The plan consists of the use of smoke-laying planes, such as are used by the military, to lay a smoke screen over a city, thus protecting it from the sun's rays. White smoke, like that used by skywriters, reflects the sun better than black smoke and so would cool cities better. Very hot days are generally caused by an absence of clouds in the sky. It is possible to make "clouds" of smoke. This is my original idea, but it can't be patented, so anyone is welcome to use it.

ALFRED SCHNEIDER

Davenport, Iowa

According to a report recently published, New York City is constantly covered by smoke, and so are most other industrial cities. Judging from the dewy brows, wet shirts and short tempers, the heat still prevails in this city, smoke or no smoke. Guess it ain't the heat, it's the humidity . . . and smoke won't cure that. And what would keep the wind from blowing away the "protective" smoke cover even if it did work? Thanks, Mr. Schneider, for your idea, but I think most people would prefer good clean air and sunshine. There's too much smoke as it is.—ED.

Girl Pilot

Gentlemen:
Flying has always interested me very much. Is there any possible chance for a girl to become a pilot on one of the airlines in this country?

G. STEBLETON

Egeland, N. Dak.

There is always a chance that some girl might get to be a working airline pilot, but right at the moment I would say those chances are pretty slim for several reasons. Right or wrong, there is widespread belief that a girl is not physically built for the rigors of airline flying over a period of time. Be that as it may, it is our belief that as long as there are good men pilots available, they will be the ones hired to fly the airliners. Perhaps men have a half-Nelson on the transportation field: we don't know of any women railroad engineers, bus drivers, steamship captains . . . or airline pilots. However, there are several young ladies who do hold air transport ratings and, if policy were different, they could hold down airline pilot jobs. But . . . and it is a big "but," we don't see any women airline pilots on the horizon at this time.—ED.

F-47 vs. FW-109

Gentlemen:
I would like to know the comparison between the F-47 and FW-109 in size, speed and maneuverability. Is the F-47 still in use? Also, I would like to know if there are any air clubs for 14-year-olds.

E. RICHARDSON

Van Nuys, Calif.

You must mean the ME-109. The FW was designated FW-190. As far as a comparison goes, all we can do is repeat the words of an Air Force pilot who flew the F-47 'Jug' against the ME-109. He said that the '47's used to throttle back to catch the '109's going down . . . all of which means the Thunderbolt *was at least as fast if not faster than the '109. As far as maneuverability is concerned, at low altitudes the '109 would take off faster and outturn the '47 on a level turn. Above 15,000 feet, however, the F-47 outmaneuvered the '109 in every department. As far as size is concerned, the F-47 had a wing span of 42 feet 10 inches and was 36 feet 2 inches long. The ME-109 had a span of 32 feet 8¼ inches and was 29 feet 8 inches long (according to Jane's "All the World's Aircraft," 1943). The F-47 is in very limited use at this time. However, there have been rumors of putting some back in action as close air support planes. The best air club for 14-year-olds that we know of is the Civil Air Patrol.*—ED.

Skyrocket Project

Gentlemen:
I would like to know if the Navy's project D-558-2, series tests with the Douglas *Skyrocket*, are still being conducted.
Also, I would like a little dope on the Republic XR-12. I've never heard of it before.

R. GOODMAN

Little Rock, Ark.

The Navy's Douglas D-558-2 is still very much alive. On June 11, Bill Bridgeman made a record-breaking flight in the ship at an "implied" speed of 1,000 mph. Officials considered to be "in the know" believe the Skyrocket *hit approximately Mach 2 at an altitude of 72,000 feet. At that altitude the speed would be 1,324 mph. The* Skyrocket *was carried aloft by a B-29 mother ship, dropped, and then Bridgeman started up the rocket engines, climbed the D-588-2 to altitude, and made the speed run. Bridgeman, by the way, is 34 years old and a pilot for Douglas. The XR-12 is a long-range reconnaissance plane powered by four P & W R-4360 engines. As far as Republic is concerned, that project is dead.*—ED.

Caution

Gentlemen:
In the interest of safety, I believe you should publish a circular letter issued by the USAF from which I quote:
"Dye-Chek penetrant is highly toxic because its content of butyl celasolve is very irritating to the eyes and other mucous surfaces . . . may cause serious injury such as kidney damage if a sufficient amount of this substance is absorbed. Take measures to prevent getting it on the skin, wear rubber gloves, remove contaminated clothing and launder before wearing again. If it gets on the skin, wipe off and then wash immediately with soap and water. Wear goggles to protect the eyes. Use Dye-Chek only in well ventilated areas, and be especially careful during warm weather . . . "
The Dye-Chek article was very well presented, and the Dye-Chek process is really as good as it's claimed.

M. H. MERZ

Palo Alto, California

Thank you for your letter, Mr. Merz. Just as with lots of good products, care is required in using Dye-Chek, but from reports we've had, the job done has been well worth the care and caution in using the process.—ED.

Defiant

Gentlemen:
Could you give me some information concerning the performance of the Boulton-Paul *Defiant*?

J. H. JOHNS, JR.

Aldan, Pennsylvania

The Boulton-Paul Defiant *was a two-seater fighter powered by either a Rollys Royce* Merlin III (Defiant I) *or a* Merlin XX (Defiant II). *The* Defiant I *had a top speed of 304 mph at 17,000 feet. The* Defiant II *had a speed of 303 mph at 12,000 feet; 313 mph at 19,000 feet.*—ED.

Lockheed

SETS PACE IN CARGO FIELD

Look to Lockheed for the first cargo transport designed purely for turbo-prop power. It's the new L-206—answer to the U. S. Air Force request for greatly stepped-up range combined with speed, capacity and loadability.

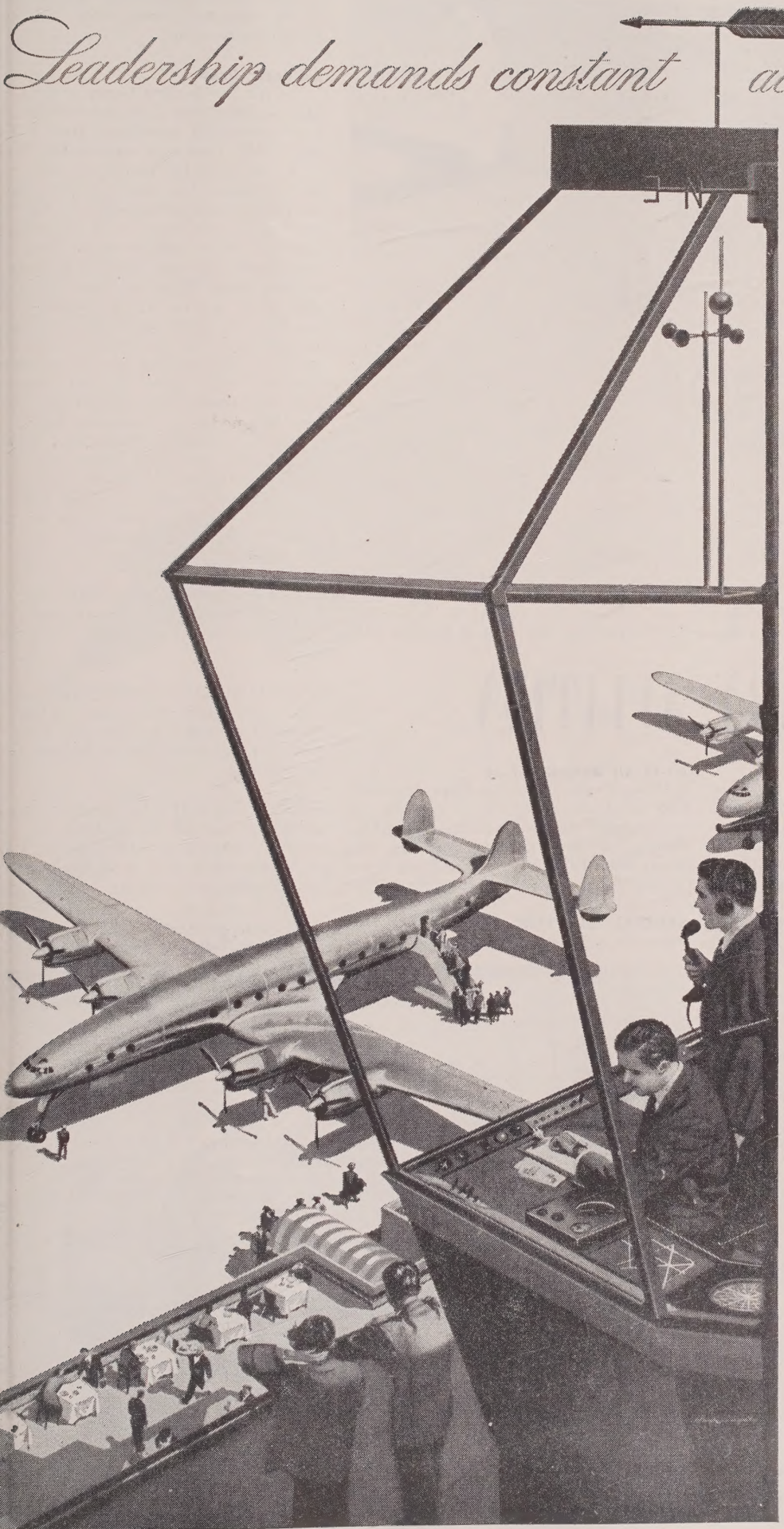
Designed in 5 months the L-206 was the competition winner among 5 manufacturers. Far exceeding minimum specifications, it features numerous Lockheed innovations: a new streamlined full-rear opening for air drops... a pressurized cabin . . . clean interior, free of interfering protuberances . . . uniform tie-down fittings . . . integral loading ramp. The L-206 will have power conveyors in its truck-high floor, only 45″ off ground.

What's going on at Lockheed?
Lockheed will whack into a billion dollar backlog when production starts in the newly opened plant in Marietta, Ga., now being tooled for the B-47 jet bomber. In Burbank assembly lines are being mechanized once again for faster jet production. New employees are being hired at the rate of 550 per week. Extensive plant expansion is now under way, including augmented facilities for advanced research.

What's being said about Lockheed?
AMERICAN AVIATION, July 9, 1951: "Constellations are now earning C&S (Chicago & Southern Air Lines) over 14c per plane mile before mail pay. Equipment reliability has been exceptional."

AERO DIGEST, June, 1951: "The Constellation, even after 12 years of life, is not now nearing the end of its cycle but is only on the edge of a virtually new era. When a company can produce an airplane for which it has a backlog of future production of 139 (April 1) units after 12 years, you know that that company has accomplished a major miracle of technical foresight, and that is, without flattery, the accolade of the Lockheed Constellation, one of the truly great airplanes of aviation history."

Leadership demands constant achievement

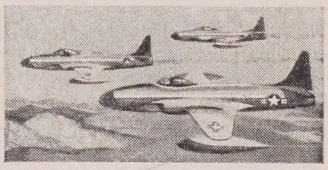


Every 80 minutes

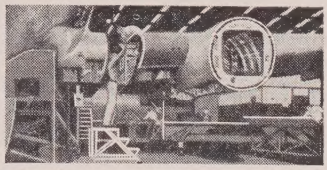
a Lockheed Constellation sets a new record for dependability!

Over 30,000 times the *dependable* Constellation has crossed the broad Atlantic... setting a record of *more crossings than all other modern airliners combined.* And every 80 minutes a Constellation repeats the performance, piling experience on experience on experience.

Twenty years of Lockheed leadership back every Constellation. Next time you fly, overseas or at home, go by *experienced* Constellation.



DEPENDABILITY IS A 20-YEAR TRADITION—dramatically illustrated today by the Lockheed F-80 *Shooting Star*... which has flown more Korean combat sorties than all other fighters combined.

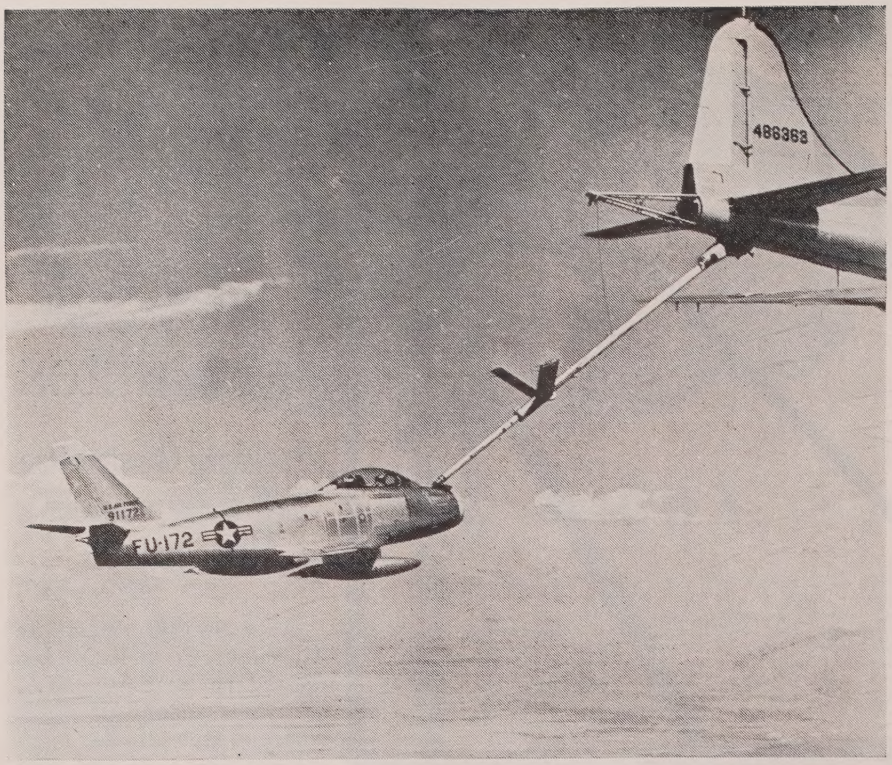


MORE THAN SKIN DEEP—Stripped down, each airplane reveals the quality behind Lockheed dependability. Its thousands of precision parts are tooled to microscopic accuracy... a tribute to painstaking research, engineering, production.

Lockheed

AIRCRAFT CORP., BURBANK, CALIF.

Look to Lockheed for Leadership



AIR-TO-AIR refueling of the F-86 *Sabre* was carried out successfully in recently completed tests. The tanker plane was a Boeing KB-29F; refueling was done at Edwards AFB

MILITARY AVIATION

Hot-Nose J-47

A large-scale production program has been set up for the all-weather turbojet J-47 with the "hot nose." This engine, designed and built by General Electric and designated J-47-GE-23, has greater thrust rating (5800 pounds) than its predecessors, has lower rate of fuel consumption, is completely anti-iced, has a special ignition system which makes possible high-altitude starts, and may be equipped for water injection for thrust augmentation. The icing problem was overcome by giving the engine a "hot nose:" hot air from the turbojet's compressor is bled to hollow parts of the nose, where the resultant temperatures are high enough to melt any ice crystals forming. Also, the air inlet screen, designed primarily to keep foreign objects from going through the engine on the ground, has been made retractable. This will eliminate the formation of an "ice dam" in the air intake when the plane is airborne. The J-47-GE-23 will power the Boeing B-47 *Stratojet*, giving it greater speed and range as well as all-weather performance.. The engine will be built by Packard Motor Car Company and the Studebaker Corporation as well as General Electric.

Scorpion Armament

Latest armament details on the USAF all-weather interceptor, the Northrop F-89 *Scorpion*, indicate the F-89 carries six 20-mm cannon in addition to having provisions for 16 five-inch HVAR rockets tucked eight under each wing. Performance data is still under wraps although the plane has been announced in the "600-mph class." It is powered by twin Allison J-35 turbojet engines with afterburners.

Air-to-Air Refueling F-86

Air-to-air refueling of the North American F-86 has been carried out successfully in tests recently completed at Edwards AFB, Muroc, California. The tanker plane was the Boeing KB-29F. Although straight and level daytime flight has been the m.o. for most in-flight refueling runs, tests with the *Sabr* proved banks and turns could be easily mad during the operation.

Bulldozer Drop

The Air Development Center of the USA has announced that a 9½-ton bulldozer ha been successfully parachuted from a Fai child C-119. Tests were made at Fort Brag N. C. As the C-119 neared the drop zon the pilot signaled the crewmen who remove the bulldozer chain tie-downs, leaving thre nylon shear-webs intact as a precautionar measure. Five seconds before the drop zor was reached, the crew pulled a safety pin o the pilot 'chute. When "on target," the C-11 pilot pulled a lever which released a sh bag from the compartment. The bag pulle the pilot 'chute outward into the wind bla and it, in turn, yanked out the bulldozer main extraction 'chute. As this extractio 'chute left the cargo compartment, thre shear knives cut the shear-webs, freeing th cargo. The extraction 'chute then dragge the bulldozer and its six 'chutes out of th plane, separated the six 100-foot 'chutes fro their containers and . . . the bulldoze drifted earthward, protected by a cras frame to absorb landing impact.

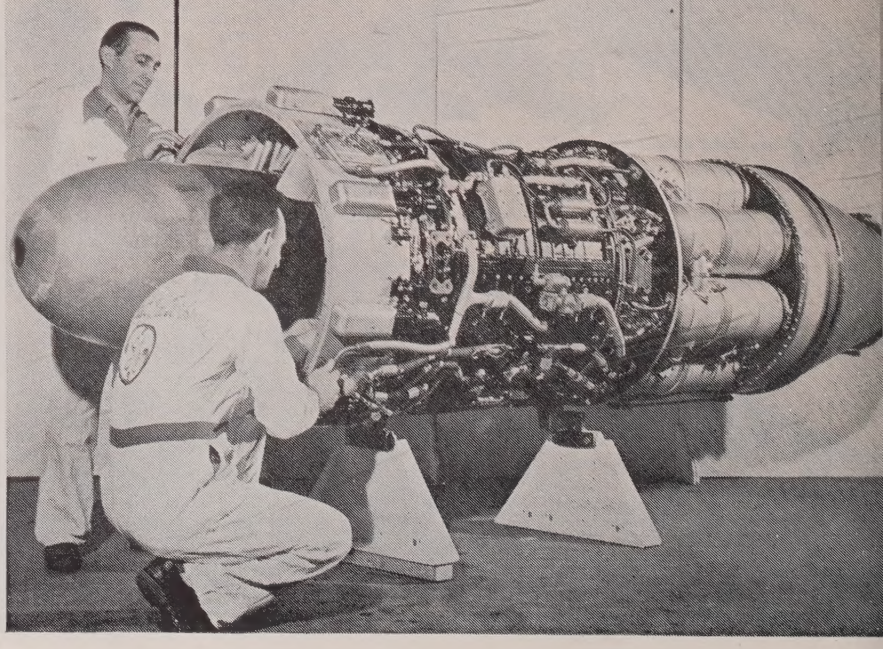
News Notes

BELLANCA AIRCRAFT CORP., of Ne Castle, Del., has signed a contract wit Glen L. Martin Co. for Martin P5M-1 Ma lin parts.

CONSOLIDATED VULTEE'S giant swep wing eight-engine jet bomber, YB-60, scheduled to make its first test flight i November, providing Pratt & Whitney J-57 are available.

CESSNA AIRCRAFT has received sub-co tracts from General Motors Corp., to mak major components for the Republic F-84 jet fighter which GM is building. Cessn will make the parts at its No. 2 plant.

GENERAL ELECTRIC J-47-GE-23 is the U. S.' first all-weather axial-flow turboj engine. It will power the six-jet Air Force B-47 bomber built by Boeing Airplane C



Higher...faster!
Let enemy planes approach at supersonic speeds and high altitudes—this new Navy jet interceptor will stop them! It's the Douglas XF4D Skyray. Now flying, the XF4D is a bat wing airplane of advanced design. The Skyray is designed for catapult take-off from carriers to intercept an enemy before he can attack us on land or sea. The Skyray was designed and built by Douglas at the El Segundo Division. It is another of the advance-type combat planes with jet, rocket and turbo-prop propulsion that reflect the pioneering of Douglas engineers in the many fields of aeronautical science. Douglas Aircraft Company, Inc.
Depend on DOUGLAS
WORLD'S LARGEST BUILDER OF AIRCRAFT FOR 30 YEARS
MILITARY AND COMMERCIAL TRANSPORTS
FIGHTERS • ATTACK PLANES • BOMBERS • GUIDED MISSILES
ELECTRONIC EQUIPMENT • RESEARCH

F-94 FLIGHT TO ALASKA

By DON DOWNIE

GLACIERS hug 12,000-foot peaks near Anchorage; this was the land below the F-94's

SKYWAYS' reporter makes jet ferry flight to Alaska in late-model F-94, the Air Force's all-weather fighter

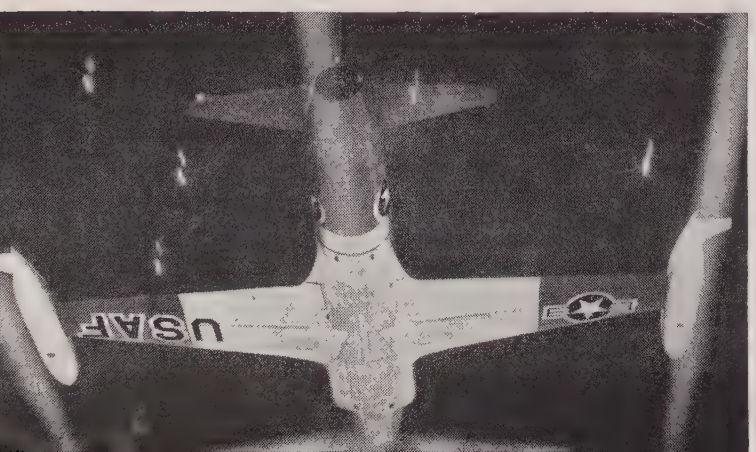
ALASKA'S fighter pilots ferry their own new jets.

When the late model F-94's were assigned to the Alaskan Air Command, regular tactical pilots of the far-north fighter groups flew their weary F-80's to reconditioning centers in small groups and ferried brand new F-94's north from the factory.

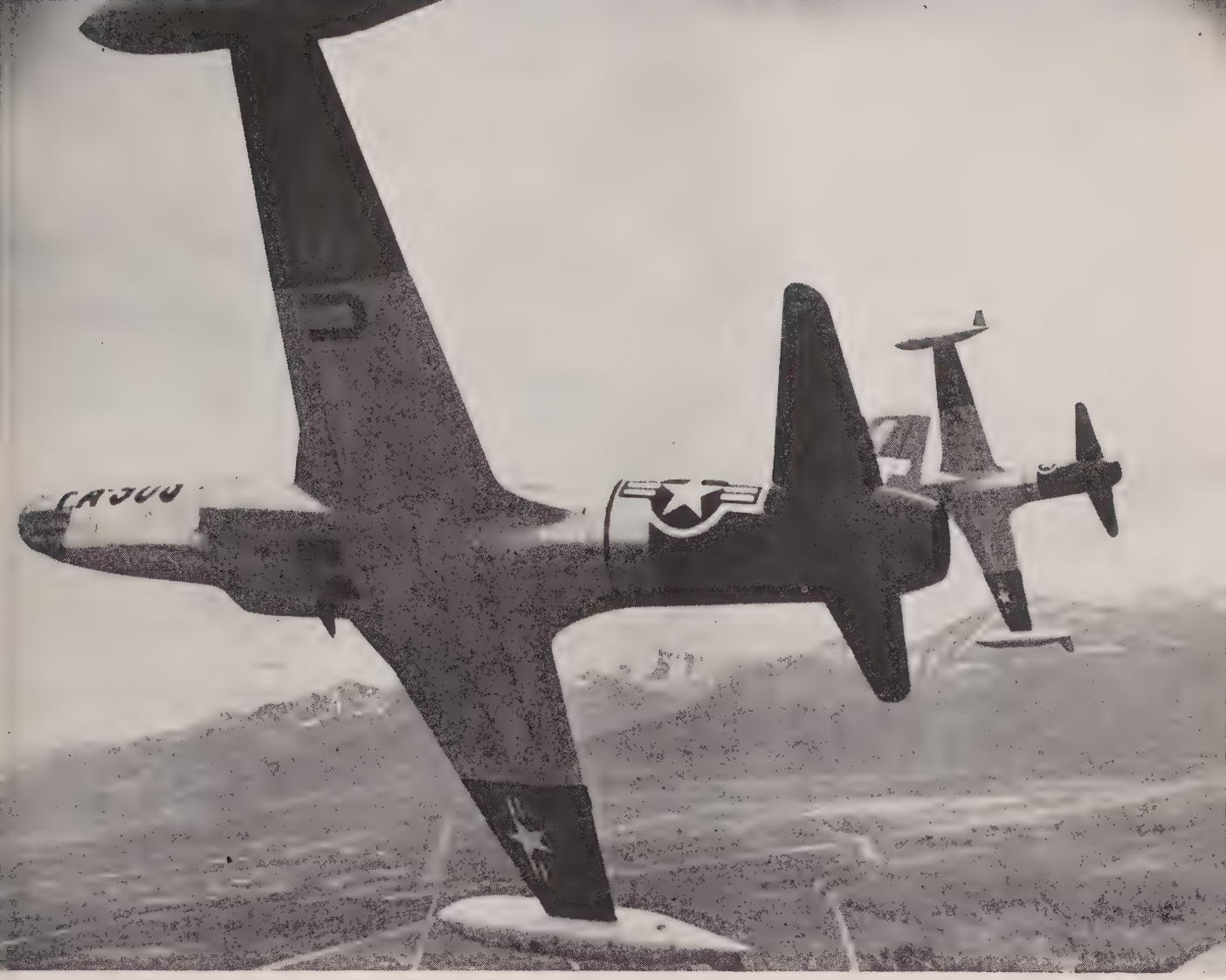
Ferrying of military aircraft is usually controlled by the Military Air Transport Service (MATS), so a handful of pilots from the regular fighter units were placed under operational control of MATS for the special movement of these aircraft. For security reasons, publication of this article was restricted until this changeover from F-80 to F-94 was complete.

Special authorization was granted by Washington and the Alaskan Air Command for this SKYWAYS reporter to accompany one of the early deliveries for this exclusive article on jet ferrying. No one was more surprised than the flight-line alert crew at Lockheed's Van Nuys, California, factory to see a correspondent, complete with Speed Graphic and lightweight portable typewriter, load his bag into the nose of a northbound

AUTHOR-PHOTOG shot this interesting close-up shot of '94 from his cockpit position beneath and behind lead plane



FERRY-FLIGHT pilots Capts. Barnes, Johnson and Wisby, look over riverboats at Whitehorse; author stands aft



AIR FORCE F-94's peel off for landing at an Alaskan base. Note dive brakes. At Fort Nelson, the jets came in on GCA

fighter and then climb into the cockpit of the '94.

Aside from the ammunition cans that were removed from the nose section to make room for a skimpy supply of luggage, there was no modification made for this ferry flight. The six planes in this flight were all standard-equipped with 230-gallon Fletcher tip-tanks and were ferried with their complete installation of guns and radar equipment.

"We'll fly daylight only and stay out of as much weather as possible," explained Captain Conrad Johnson of Fergus Falls, Minn. He drew the job of carrying the correspondent in the back seat of his airplane. He's 33 years old, has over 3,000 hours of single-engine time and has been flying jets for over four years.

"I'll check you out on the emergency equipment in the plane," said Captain Johnson as we walked out toward the big red-tailed fighter. "First, you

WEATHER held up jets at Fort Nelson, but following morning take-off was made for Whitehorse. By riverboat, trip upstream takes 5 days; F-94's cruised it in 12 minutes. At Whitehorse, pilots practiced an instrument let-down

LOCKHEED F-94 "slugs" fuel overboard in flight. This happens briefly as the jet plane's wing-tip tanks empty

FERRY PILOTS inspect a section of the Alcan Highway. They are *(left to right)* Downie, Barnes, Johnson and Joe Wisby

don't pull any emergency control unless I tell you to or I've obviously passed out. In that case, the yellow handle here on the right will jettison the canopy. There's one of these handles in each cockpit to fire the explosive charge that will blow off the plexiglas. Then you arm the ejection seat by pulling up on these two arm rests. Make sure that both feet are on the stirrups before you pull the trigger. That'll blow you clear of the airplane. Then pop your safety belt to get away from the seat and open your 'chute normally.

"I doubt that you'll have any occasion to use that equipment," he added with a grin, "but since it's in the airplane, you'd better know how it operates."

Then we wrestled into a back-pack parachute, crash helmet with oxygen mask, and climbed into the back seat. Captain Johnson helped hook up the oxygen and showed how the shoulder-straps hooked into the safety belt. When you're tied into one of these fighters, you're really there to stay.

The pilot climbed into the front cockpit and quickly donned his own safety equipment. The yellow starter unit parked alongside burst into power and soon the whine of our own turbojet engine was heard.

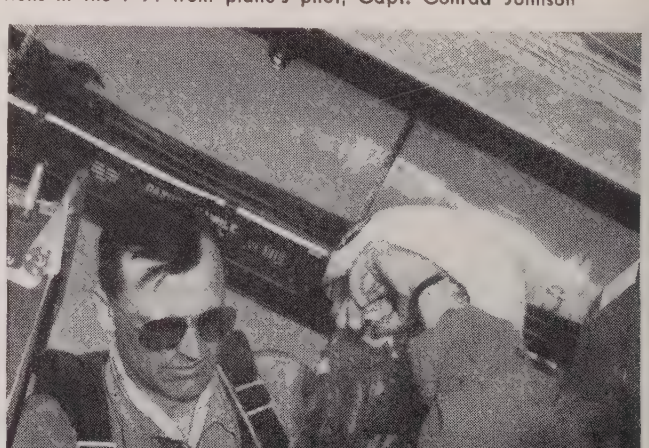
"Pull in your arms," said Captain Johnson over the intercom. "The canopy is coming down . . . now." The electric motor closed the big clamshell quickly, pressure in the cabin increased for an instant and then went back to normal. If you have any tendency toward claustrophobia, stay out of the back seat of one of these new fighters.

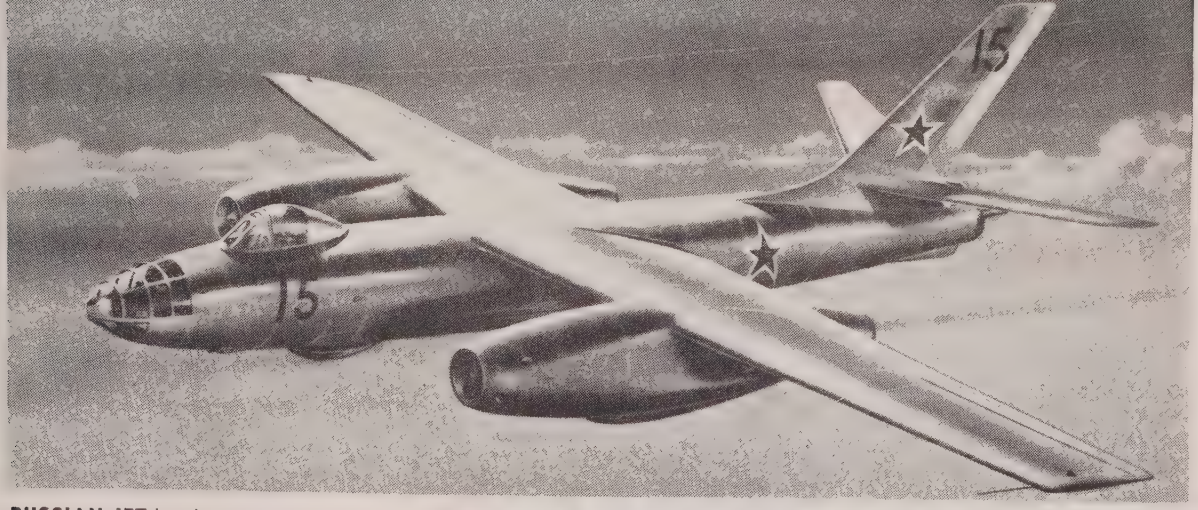
The intercom system is switched on between both cockpits all the time, so you don't have to mash down on any button to talk to the pilot. In addition, the back-seat passenger can hear all radio transmission on the VHF channels.

With two other F-94's flown by Captain Roy Barnes of San Francisco and Captain Robert T. Goetz of Osceola, Ark., we taxied away from the factory acceptance line. The three other ships of this flight had departed for Las Vegas, Nevada, the night before.

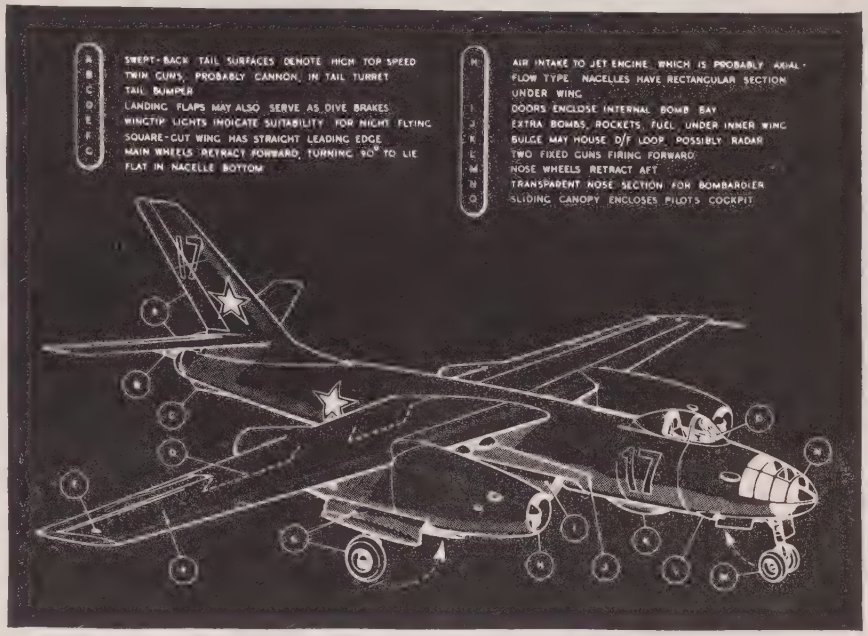
We lined up at the end of the runway in tight formation and started to roll. "There's no complicated warm-up," explained the pilot as we started our roll. "Just make sure that your fuel pumps and electrical system are *(Continued on page 40)*

REPORTER Don Downie gets emergency ejector-seat instructions in the F-94 from plane's pilot, Capt. Conrad Johnson





RUSSIAN JET bomber, reportedly designated Tu-10, is the Red Star answer to the *Canberra*. Estimated speed of Tu-10 is about 540 mph at sea level


A SWEPT-BACK TAIL SURFACES DENOTE HIGH TOP SPEED
B TWIN GUNS, PROBABLY CANNON, IN TAIL TURRET
C TAIL BUMPER
D LANDING FLAPS MAY ALSO SERVE AS DIVE BRAKES
E WINGTIP LIGHTS INDICATE SUITABILITY FOR NIGHT FLYING
F SQUARE-CUT WING HAS STRAIGHT LEADING EDGE
G MAIN WHEELS RETRACT FORWARD, TURNING 90° TO LIE FLAT IN NACELLE BOTTOM
H AIR INTAKE TO JET ENGINE, WHICH IS PROBABLY AXIAL-FLOW TYPE. NACELLES HAVE RECTANGULAR SECTION UNDER WING
I DOORS ENCLOSE INTERNAL BOMB BAY
J EXTRA BOMBS, ROCKETS, FUEL, UNDER INNER WING
K BULGE MAY HOUSE D/F LOOP, POSSIBLY RADAR
L TWO FIXED GUNS FIRING FORWARD
M NOSE WHEELS RETRACT AFT
N TRANSPARENT NOSE SECTION FOR BOMBARDIER
O SLIDING CANOPY ENCLOSES PILOTS' COCKPIT
17
17

Soviet Jet Bomber... Tu-10

It has been said that Russia's war potential has been more presistently under-estimated than that of any other nation. It is certainly true that recent months have called for considerable re-evaluation of Soviet progress in the design and quantity manufacture of modern combat airplanes. "Guesstimates" of Russia's air strength and the quality of Russian equipment have only just become usefully speculative as opposed to purely fantastic.

In the past there have been two main schools of thought regarding Russian post-war aviation progress: one school would have had us believe that Soviet secrecy denoted more rapid advances in aviation technology than had been made in the West, and a natural desire to keep revelations for a time when it would be to their advantage. The others believed that Russian aviation was so helplessly behind that of the United States that the Soviet Union did not wish to disclose her inability to keep abreast with world progress in this important sphere.

Truth often lies midway between opposing schools of thought and, from what we have learned from air warfare in Korea and the information that continues to filter through the tight mesh of the Iron Curtain, this appears to be especially applicable to Soviet combat-aircraft development. We know that, on the score of modern jet-fighter aircraft, Russian machines are at least equal and in some respects superior to their operational counterparts in the West. We also know that the mainstay of Soviet strategic bombing squadrons is the Tupolev Tu-4, a "pirated" copy of the B-29 *Superfortress* which has for long been considered obsolescent in the USAF.

However, we should remember that the Soviet conception of air power is diametrically opposed to our own in that there is no Soviet Air Force as such; almost all air units are directly under the Army or Navy. Very naturally, in view of the size of the Red Army, the majority of the air units come under direct army control. Furthermore, the air armies are used primarily as instruments for the direct and immediate support of the land forces. Thus, it is to be expected that the development of modern strategical bombers will take second (*Continued on page 38*)

By WILLIAM GREEN

FLIGHT PATTERN FOR BUSINESS

By ELIOT TOZER

COMPANY PLANES of the multi-engine type number more than 1400. Plush DC-3's, like this one above, sleep two on divans up forward, seat 16 comfortably. There's a bar in aft section. Some companies operate single-engine planes

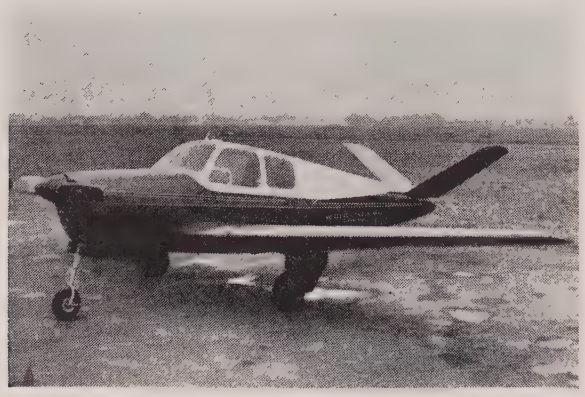
A gleaming DC-3 cleared from the Teterboro Airport traffic pattern the other night and climbed to altitude for a non-stop run to Birmingham, Alabama. There were only four passengers aboard, top engineers and geologists of a Manhattan construction company. Shortly after take-off, the four men settled down to play poker until it was time to pull out their individual, full-length, innerspring bunks.

The DC-3 touched down at Birmingham on schedule and one of the geologists left for an appointment in the city—with time to spare. Meanwhile line mechanics had quickly refueled the DC-3, and just before take-off, two engineers from the Manhattan firm's Birmingham office and a government representative climbed aboard.

An hour later, the DC-3 touched down at a small airport a few miles from the site of a proposed dam. That night, after day-long conferences at the job, the engineers returned to Birmingham, then in an easy hop, flew back to Manhattan.

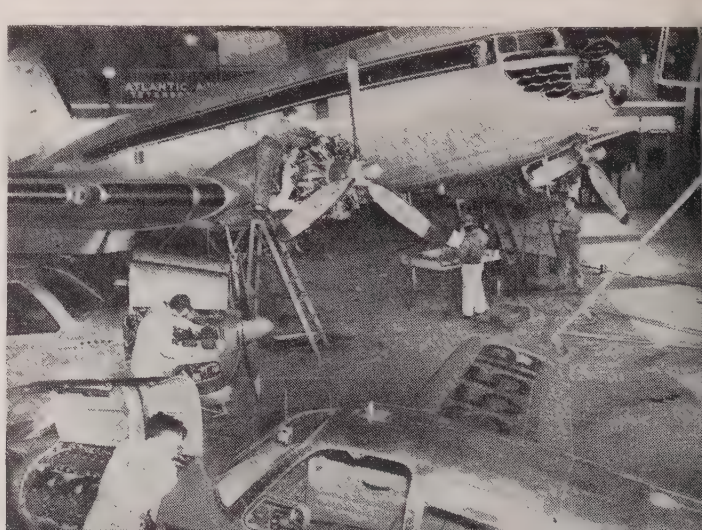
To pilots and executives it was a fast, safe, and comfortable hop. Fast, safe, comfortable—and routine because both the operation and maintenance of aircraft by private business has finally begun to shake down into a smooth pattern.

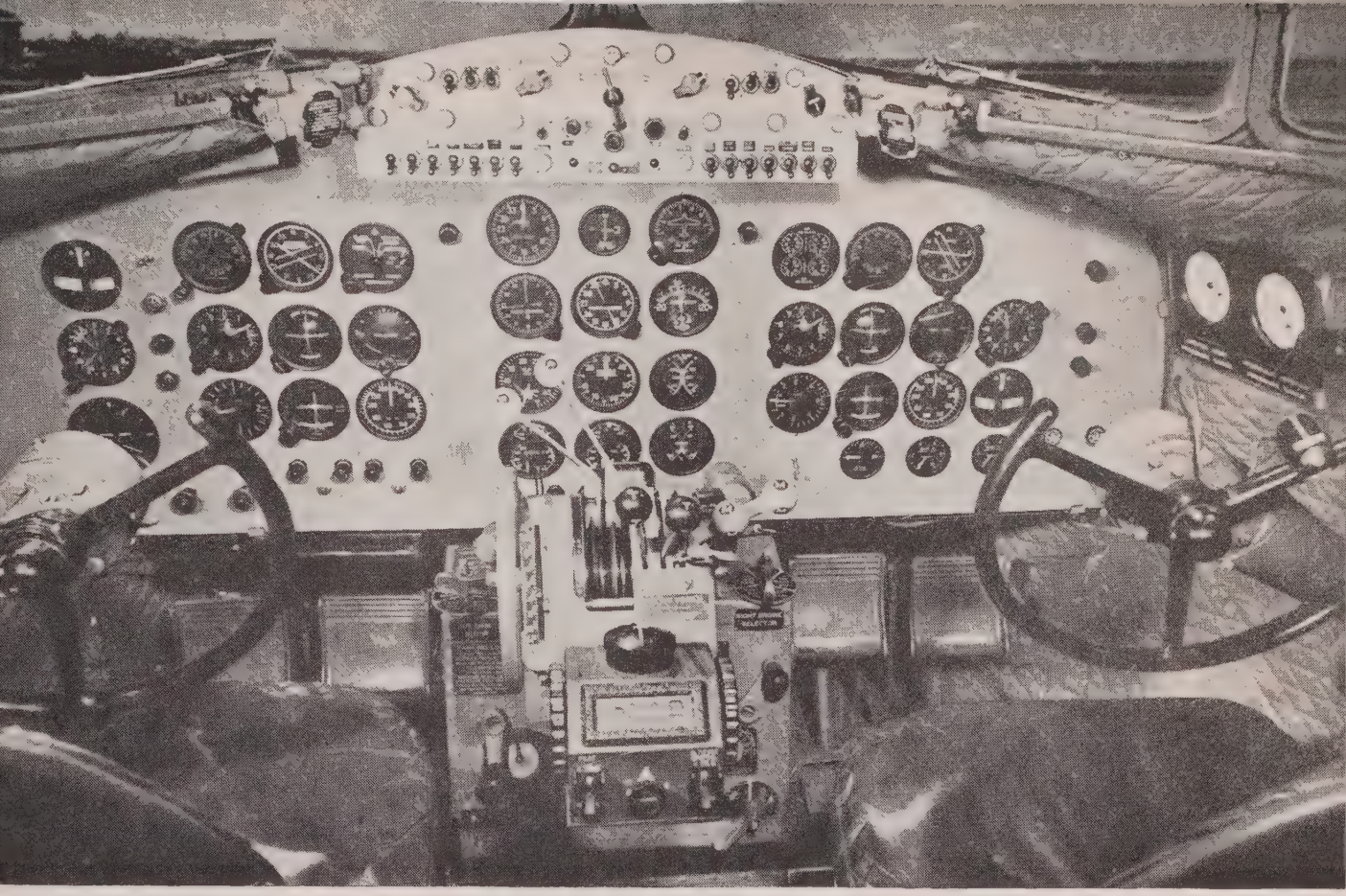
The operation of executive aircraft has fallen into this well-regulated pattern for several reasons. Probably the most important reason is that there have been such rapid advances in radio and electronics



GRUMMAN WIDGEON is owned by Heyer Industries of Belleville, N.J. Amphibian's water-and-land versatility adds to utility

AIRCRAFT SERVICE operators such as Atlantic Aviation *(below)* hangar corporate planes, provide all servicing, etc.





INSTRUMENT PANELS on executive aircraft are as complete, sometimes more complete than those of airliners. This panel *(above)* is "front office" of a corporate DC-3, and includes Sperry Zero Reader, Gyropilot, gyro-horizon, etc.

in the last few years. Now available to the capable pilot are the Automatic Direction Finder, commonly called "Bird Dog," Very High Frequency Omni-Directional Radio, Glide Path or Instrument Landing System, plus the older low frequency radio and manually operated loops.

Another reason executive aircraft operation fits a sound pattern is that there are plenty of topnotch aircraft models—some with excellent war records —to choose from. And finally, there are good pilots available with several thousand hours air time.

In choosing an airplane, the first consideration after safety is utility. And utility is governed for private concerns by the travel pattern of the concern's executives.

It's well known that today's executives do most of their traveling in the eastern half of the United States. For such trips executives could use planes as small as the Beechcraft *Bonanza* or as large as the Convair 340 and the Martin 404. But, generally speaking, the top brass in most companies choose the medium-sized DC-3. The DC-3 is large enough to cover half the continent in one hop. As far as the smaller planes are con- *(Continued on page 46)*

HANGAR belonging to Mallard Air Service at Teterboro, N. J., houses executive aircraft belonging to Texaco, Whelan Drugs, General Foods, Nat'l Distillers, Arthur Godfrey, Brewster Construction Co., Packard-Bamberger, V. Astor

Tower Tips

PILOT, all set for take-off on cross-country trip, gets his take-off instructions from tower operator via radio

On a black night over San Antonio two airplanes narrowly averted a nasty crash. Both craft were on the landing glide to the field. The airport was well lighted. An alert tower operator had cleared both pilots to land . . . on parallel runways. But someone got his wires crossed.

On the final approach, the horrified tower operator watched as one plane skidded directly over the other. As the planes neared the final round-out—one above his fellow—the operator called into the microphone crisp, desperate instructions for both airplanes to pull up and go around.

Evidently, neither pilot was listening. Having received landing instructions, they both had removed their headphones. Now the frantic operator saw, as if by a miracle, the two planes escape disaster. Landing seconds apart, the planes came to the ground. And a very frightened and troubled airman in the latter machine wondered what had happened as he fought to steady his wavering craft in a cloud of propwash and dust.

The operator in San Antonio was one of hundreds of CAA and military technicians located across the country to assist pilots. Night and day these men and women are on duty to help you and me achieve flying safety. They are trained to do their job well. In dozens of instances where minor and major accidents have occurred, a study of the facts show that their guidance and instruction was deliberately

TOWER OPERATOR sees plane taxiing to take-off position this way. He has given pilot wind direction, velocity, and the runway to use

By WESLEY NEAL

or unknowingly ignored. Take the case of the upset aviator in Indiana.

Approaching the airport late one afternoon, this lad was warned that the field would be temporarily closed due to local thunderstorms. But the pilot landed despite the warning. That he was grounded was of little consequence compared to the expensive damage suffered by his plane.

An increased emphasis on radio-equipped light aircraft makes pertinent a study of CAA tower procedures and their advantages. Whether landing, taking off, flying cross-country or just plain taxiing, the tower operator has a friendly and worldy-wise word of advice for the private pilot. How best may we use his benefits?

Of primary importance is an understanding of the phonetic alphabet. Literally, this is just what it implies: a system of word sounds which *always* represent the same letters. I once knew a pilot who flew 500 miles out of the way because he misunderstood a radio message. Wartime missions have been known to be thrown completely off timing because of this confusion of radio speech. And this in spite of careful enunciation. Here is the current phonetic alphabet as used by the CAA. Learn it. It is as fundamental as coordination exercises, for all radiotelephone communication is based upon it.

A-Able .—	J-Jig .———	S-Sugar ...
B-Baker —...	K-King —.—	T-Tare —
C-Charlie —.—.	L-Love .—..	U-Uncle ..—
D-Dog —..	M-Mike ——	V-Victor ...—
E-Easy .	N-Nan —.	W-William .——
F-Fox ..—.	O-Oboe ———	X-Ray —..—
G-George ——.	P-Peter .——.	Y-Yoke —.—
H-How	Q-Queen ——.—	Z-Zebra ——..
I-Item ..	R-Roger .—.	

There are three more key words which we should understand before going on to general tower practices. First of these common expressions is "over."

Whatever the nature of the call, either from the tower or the pilot, the word "over" is used when a reply is expected. For example: Aircraft: LOS ANGELES TOWER THIS IS PIPER ONE TWO FIVE SEVEN FOUR. ON EAST RAMP READY TO TAXI, FLIGHT TO BAKERSFIELD, OVER."

Next is the word "Roger." Because of wartime increase in flying activity, this word has almost forced its way into the vocabulary of everyone from school sophomore to hod carrier. But in CAA parlance, it has a definite meaning. Pilots should conform to this strict sense of the word. It means, "I have received all of your last transmission. In the interest of good radio technique, the word should not be used for any other purpose.

"Out" is another expression which is widely used. It implies "My transmission is ended, I do not expect a reply from you." Obviously, the word "out" is used only at the end of a conversation.

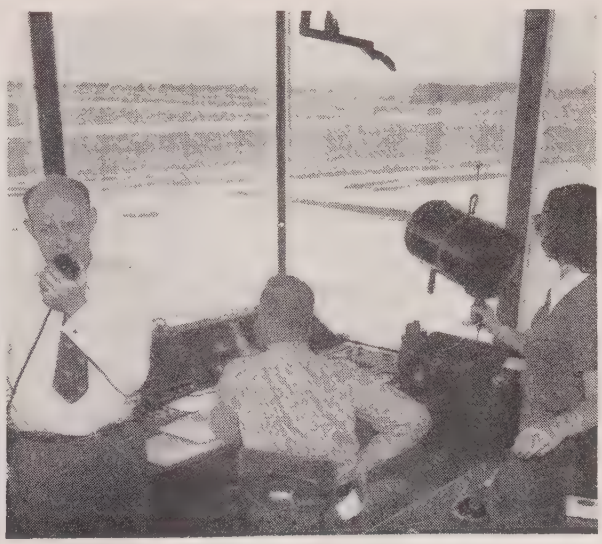
There are a few more code words which have a definite place in common radiotelephone procedure. With their meaning, these are listed as follows:

CORRECTION	"An error has been made in this transmission. The corrected version is . . ."
SAY AGAIN	"Please repeat your message."
THAT IS CORRECT.	(This is self-explanatory.)
HOW DO YOU HEAR ME?	Self-explanatory.
SPEAK SLOWER	Self-explanatory.
NEGATIVE	"No. That is not correct."

Although the reader may be inclined to think of the above as much ado about nothing, one good practical experience when a man's neck is at stake may prove its value. Consider a narrow squeak I had once at Fort Worth. (*Continued on page 54*)

CONSTANT SURVEILLANCE of local area is maintained by tower operators. In this way they keep flight on safe side

VISUAL signals are used for planes not equipped with radio. Here, girl operator gives pilot take-off green light



Taming the Mustang

U.S. Mobile Training Detachment flies anywhere to teach plane operation

OPERATION know-how and proper maintenance would have prevented this non-combat accident in Korea. Mobile Training Unit answered problem

ROKAF and American airmen were taught how to operate and maintain the *Mustang*, the AF's close-support workhorse in Korean war, by men of F-51-4 Mobile Training Detachment, operated by the 3499th Training Aids Wing

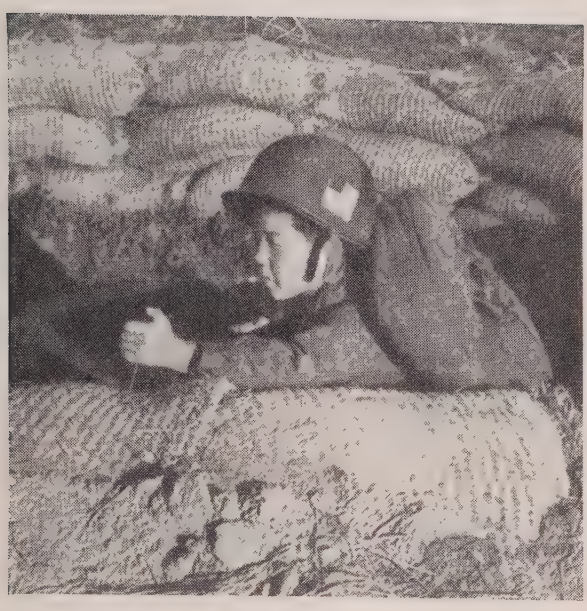
By Capt. D. B. OATLEY

THE snarl of an in-line engine rose to a whine as the F-51 *Mustang* gained speed in its headlong rush down the muddy Korean air strip. Then, it was airborne. Suddenly, however, the fighter faltered, stalled, and fell off on one wing. Engine screaming, it plunged into the ground.

Fire blossomed just off the end of the runway. Flame and smoke mushroomed, obscuring the bright South Korean Air Force insignia on the fuselage of what, only a moment before, had been an efficient aerial weapon. Heat fanned out, so intense that would-be rescuers were forced to halt yards from the blazing wreckage.

Killed in the crash was the pilot, a young South Korean who had been too hastily trained to fly and fight the plane which had just become his pyre. Reason for the accident was sickeningly apparent to several men who witnessed the tragic event that grey day in September of 1950.

Had not the on-rushing North Korean Communists been so dangerously near, the dead youth might have been adequately prepared when he



MASCOT "adopted" by detachment was Kong U Suk, or "George" as he was nicknamed by men. Here he plays soldier

INSTRUCTOR O'Farrell explains complexities of F-51 generator to South Koreans. Man at his side is the interpreter

climbed into his *Mustang* at Chinhae Airfield, north of Pusan.

But, there it was, just as it usually is early in an unexpected war: pilot, dead; aircraft, total loss. Worse, there were many other South Korean airmen who desperately needed the training which their dead comrade had lacked. However, there was one small, bright spot in the otherwise gloomy picture.

The tiny ray of hope lay in the presence at Chinhae that day of two USAF representatives who had landed at the field less than an hour before the ill-fated F-51 went into its last plunge.

These two men, Lt. Robert Denomy and M/Sgt. Sam Swiggum, were the advance element of a nine-man team which would, in the ensuing months, contribute mightily to a rapid decrease in the number of accidents such as the one they had just witnessed.

Lt. Denomy was the commander of F-51-4 Mobile Training Detachment, one of more than 50 easily transportable "flying classrooms" operated by the 3499th Training Aids Wing based at Chanute Air Force Base in Illinois. Sgt. Swiggum was NCO in charge of the unit and Denomy's right arm.

As the pair had clambered down from an overworked C-47, they were greeted by General Kim, chief of staff for the Republic of Korea Air Force (ROKAF); his aide, Colonel Chang, and Major Dean Hess and Captain John Weiner, chiefs of a USAF advisory unit attached to the South Korean air force.

The meeting there on the muddy strip culminated many weeks of work, worry and waiting. The arrival of Denomy and Swiggum marked the successful conclusion of a race against the rapid southward surge of the North Korean hordes.

Indicative of how important the time element had become was the presence at the field of all available cargo planes, standing by to evacuate personnel, material and anything else which should not be left to fall into enemy hands.

In the desperate attempt to halt the relentless Red advance, the *Mustangs* were playing an heroic role. Theirs was the task of strafing, napalm bombing, reconnaissance and any other mission which might provide close support for the sorely pressed (*Continued on page 44*)

GAGE instructor T/Sgt Martin *(seated fourth from left)* takes time off to pose with his class of S. Korean cadets. Note dismantled C-47 in background, made non-flyable in event the enemy capture the airport at Chinhae where training school was located

AERO COMMANDER, shown here coming in for a landing, is powered by two geared Lycoming 260-hp flat-six engines

TAKE-OFF performance is excellent; it will get off with full load in just 600 feet. Best rate of climb is 110 mph

Pilot's Report...

The Aero Commander

IF THAT engine quits, where'll I put this airplane down?

What pilot hasn't asked himself that question while perspiring freely out over mountains, desert or water. Forced-landing practice has always been part of the flight curriculum—but those headaches seem to be gone forever with the new twin-engined Aero *Commander*.

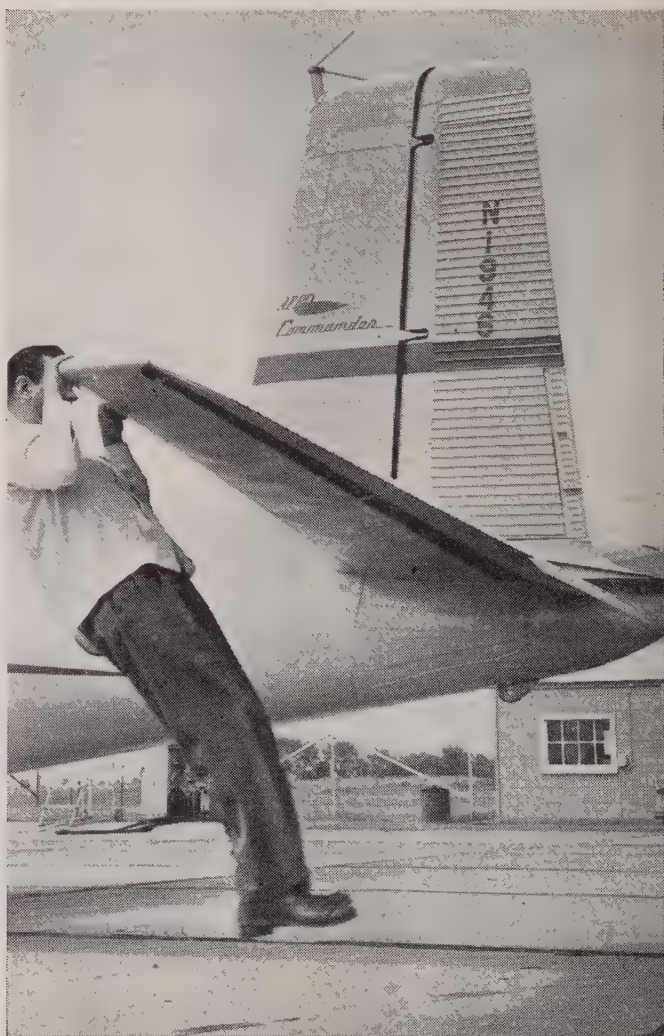
Here's a five-to-seven place executive transport that will really operate on one engine. Factory test pilot Bert Bantle recently proved it when he flew non-stop from Oklahoma City to Washington, D. C. —with one propeller removed.

Latest in the list of CAA-certificated twin-engined executive planes, the Aero *Commander* is now being produced in Oklahoma City. The 230 employees have completed extensive tooling and will be pushing completed planes out the factory door by the time this article is in print.

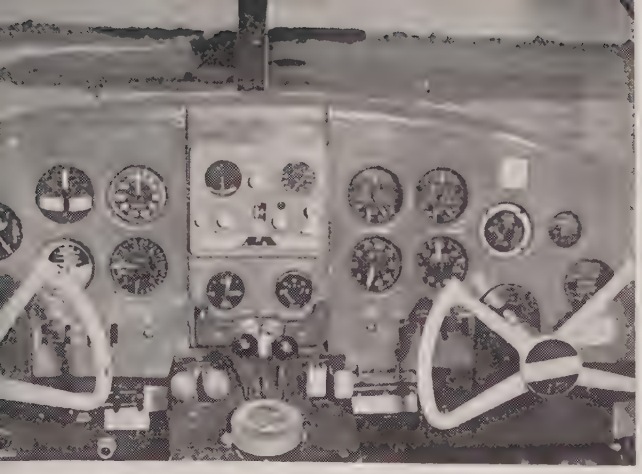
The original idea for this small twin-engined transport came from Ted R. Smith who was in charge of the design teams on the A-20 during the last war. He drew up the original plans for the *Commander* after working hours. With the help of nearly 25 other Southern California aircraft specialists, the first prototype was hand-built in a small hangar in Culver City, California. When both adequate financing and a large number of trained aircraft production workers were found in Oklahoma City, the project was transplanted there. Ten key men resigned from West Coast aircraft factories to accompany the new plane.

For this SKYWAYS pilot report, test pilot Bert Bantle went along to demonstrate the unusual features of this midget airliner. Mr. Bantle is a former CAA flight-test pilot

STRENGTH and solidity are built into the tricycle-gear *Commander*. Here, Bert Bantle chins himself on stabilizer



By DANA CRAWFORD



INSTRUMENT PANEL on the prototype *Commander* shows the flight gages in front of pilot, engine gages on right

who flew evaluation hops on the DC-6, *Constellation*, Convair Liner and—in contrast—the Thorpe *Sky-skooter*.

The original Aero *Commander* was parked in the corner of the humming 38,000 square foot hangar at the Tulakes Airport, Oklahoma City's secondary municipal airport. While the flight characteristics of N1946 are parallel with the new models nearing completion, the interior was filled with test equipment and experimental soundproofing. Production

LANDING GEAR is built around BT-13 unit, *Navion* nose-wheel. *Commander's* wheels and disk brakes are Goodyear

SINGLE-ENGINE PERFORMANCE was proved by non-stop flight from Oklahoma City to Washington, D.C., with one prop removed. Trip was made in 7 hours 55 minutes, with plane taking off carrying full gross weight of 4800 pounds

MAIN GEAR of this five-to-seven place executive airplane has a spread of 12 feet 4 inches; makes handling very easy

models will have the benefit of interior design by A. H. Moore in charge of Aero *Commander* engineering and who assisted with interior work on the DC-6.

"We can check out any pilot with *Navion* or *Bonanza* experience in less than two hours," said the test pilot as we walked out to the plane on a humid, sultry summer afternoon. "As long as the pilot is a little familar with retractable landing gears and flaps and adjustable propellers—the modern refinements so necessary to high performance—he'll have no trouble with the Aero *Commander*. Actually, those two engines present more of a mental hazard than an actual problem. Once the pilot quits worrying about those two propellers, he can fly this plane just like any other."

While the two engines are the most important feature of this new plane, the design has several other improvements in its favor. The women who fly in this small executive transport will love it since they need no step ladder or helping hand to climb aboard. The door is wide and only 19½ inches above the ground.

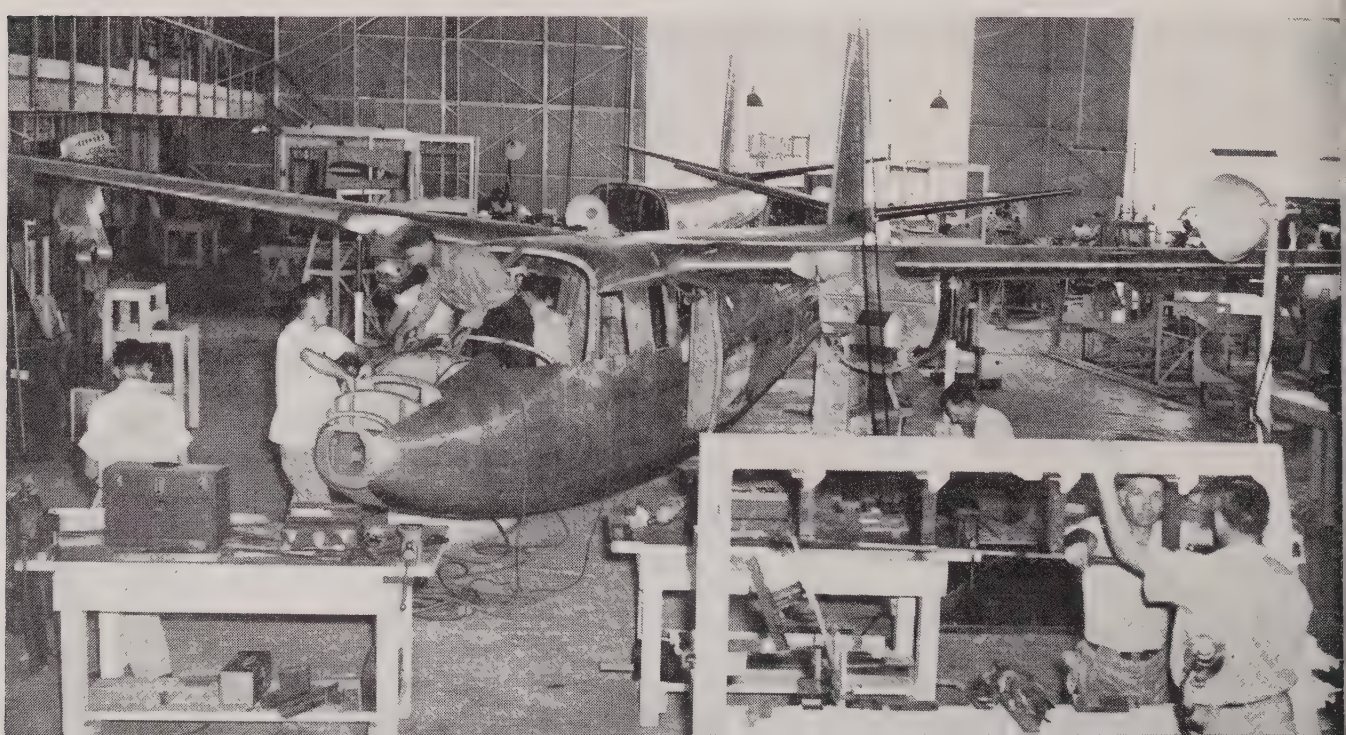
The fuel system on the production model will be a single valve unit with merely an ON-OFF switch to supply each engine.

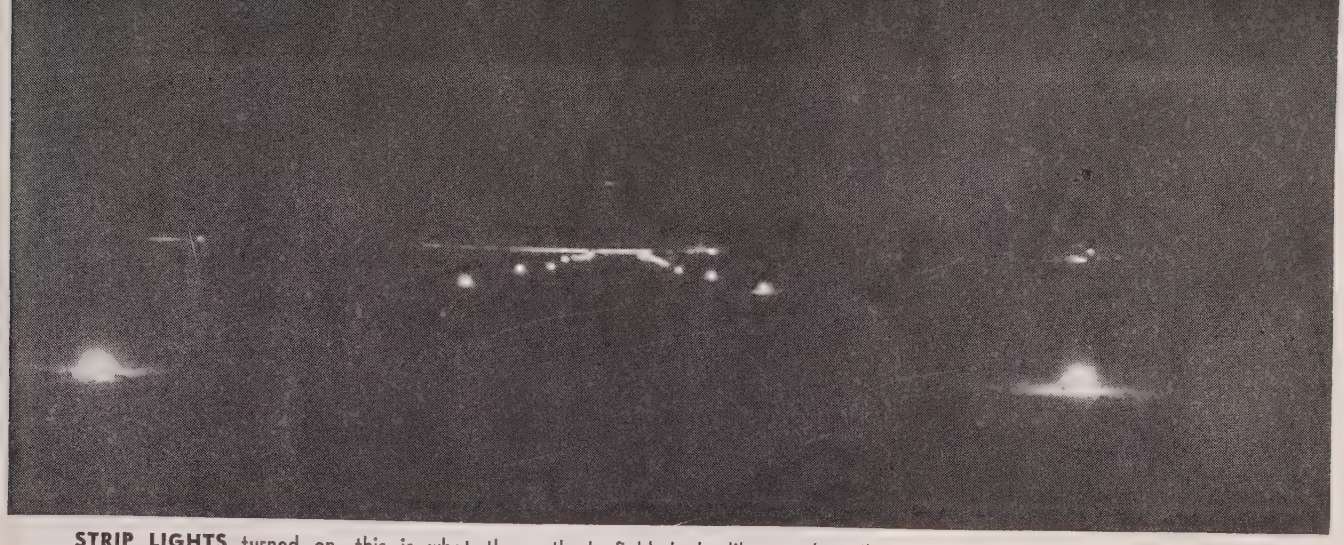
The complete engine and propeller combination is well-proven and parts are available at most airports since it is the same as the *Super Navion*. The *Commander* mounts two geared Lycoming 260-hp six-cylinder engines with Hartzell full-feathering constant speed hydraulic propellers.

The nose gear assembly is also from a *Navion*. This new company has arranged to buy the complete assembly for the non-steerable nose unit of the rugged *Navion* gear.

The main landing gear is built around a BT-13 unit, hinged at the top (*Continued on page 48*)

AERO DESIGN & ENGINEERING has 210 employees making *Commanders*. So far, deposits have been placed for 20 planes





STRIP LIGHTS turned on, this is what the author's field looks like to the pilot coming in for a night landing

Your Own Strip Lights

By R. J. CLASSEN

It wasn't long after buying an airplane that I discovered its usefulness seemed to end at sundown, or maybe a little before. The situation was comparable to owning an automobile without lights—and having to schedule the use of it in such a way as to insure getting home by sundown.

To overcome this handicap I purchased four sets of truck flares to outline our private air strip. With the flares available, we were all set to cope with any unexpected delay that would bring us in after dark. And the delay wasn't long in coming.

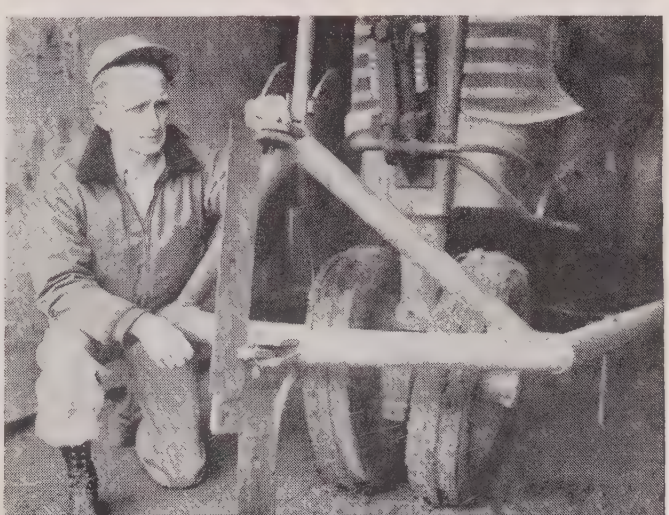
Arrangements had been made to fly to Bloomington, Illinois, 60 miles away, to visit my wife's parents. I suspected this might be the time to be ready for a late landing, and so at 10 A.M. I set out the flares. They were rated to burn about 15 hours, long enough to light the runway until late at night. Confidently, my wife and four children crawled into the Stinson with me and we were off to visit Grandpa and Grandma.

Grandpa was at the airport to meet us and, on the way to the house, informed us that my wife's brother would do the honors of the return ride to the airport that evening.

Late in the afternoon (*Continued on page 51*)

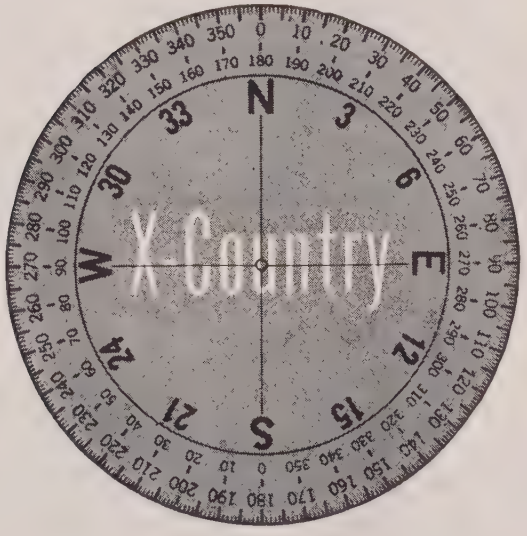
LIGHT ASSEMBLY consists of metal roof painted white, 15-watt bulb, weatherproof socket, held here by author's son

PLANE-OWNER Classen increased usefulness of his Stinson by installing own set of strip lights for night landings

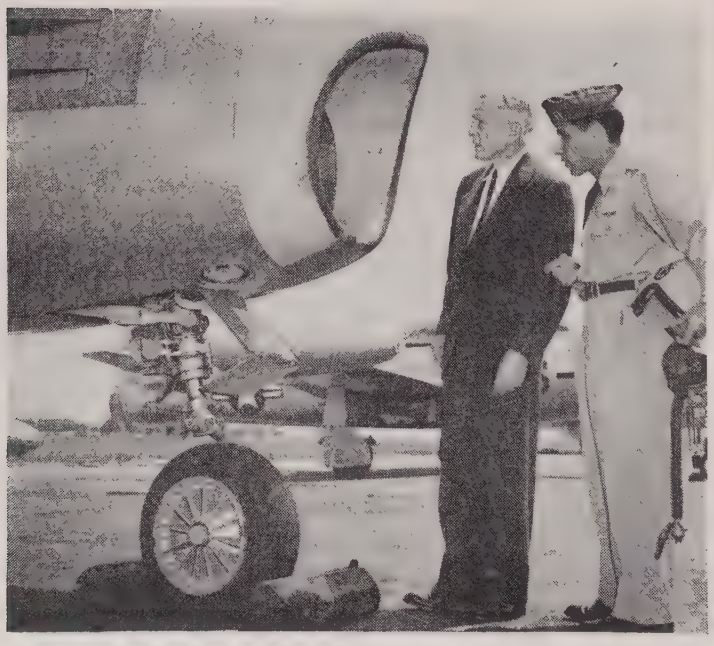


BLADE ATTACHMENT on the author's tractor was used to lay 4,000 feet of trench wire in a ditch alongside the strip

TWIN CELEBRATIONS—Lauritz Melchior, the tenor, recently celebrated 25th anniversary of his debut in America. With his wife, Kleinchen Melchior, he also celebrated his one millionth mile of air travel. On their departure for Europe, via Pan American Airways (*right*), the Melchiors were presented with a cake and a party was held aloft. Not long ago he chartered two planes and, accompanied by his own orchestra, he gave 56 concerts on 56 consecutive days in 56 different cities in U.S.



ALTITUDE MARK—What is believed to be the first unofficial world altitude mark for jet-propelled helicopters was set recently by a late version Hiller *Hornet*, ramjet 'copter designed and built by Hiller Helicopter, Palo Alto, Calif. The *Hornet* was piloted by Bruce Jones. In the photo (*below*) the Hiller *Hornet* is shown flying above the 7500-foot level over Donner Pass in California's High Sierras. The *Hornet* is powered by two small ramjet units, one mounted on tip of each rotor blade. These powerplants burn 50 gallons of fuel per hour; fuel is heating oil.



PROGRESS—At an air show at Scott AFB, Illinois, Brig. Gen. Frank P. Lahm was "introduced" to jet aviation by USAF ace Capt. James Jabara. In 1909, Orville Wright and Lieut. F. P. Lahm flew one hour, 12 minutes over Fort Meyer parade grounds—and the USAF was born. Forty-two years later, at Scott AFB, retired Brig. Gen. Lahm watched Capt. Jabara stunt a $350,000 F-86 *Sabre* as part of the spectacular air show. In this photo (*left*) Capt. J. Jabara and Gen. Lahm peer down the jet intake.

NIGHT FIGHTER—This two-place night fighter, Armstrong Whitworth *Meteor* NF-11, is now in production in England for the Royal Air Force. Developed from the famous Gloster *Meteor,* the NF-11 is powered by two Rolls-Royce *Derwent* engines and it carries extra fuel in ventral and wing drop tanks. Called "heaviest, biggest night fighter in the world," the NF-11 is armed with four 20-mm cannon. It carries extensive radar equipment in its nose. Recently, a *Meteor* NF-11 flew from Coventry to Le Bourget (Paris) in 35 minutes.

NIGHT PATROL—Lockheed F-94 all-weather fighters like these planes on night patrol over California are assigned to air defense of the U. S. In this photo (*left*) streams of fire flash from their Allison jet engines as two of the planes turn on their afterburners. The afterburners give extra thrust for bursts of speed and faster climb. The F-94 is the first of the U. S. airplanes to place afterburners into operational use. This photograph was made against a Pacific sunset as three of the AF planes began a night training mission. The '94's are equipped with extensive radar, enabling them to "see" in darkness.

INSIDE JOB—This is probably the first man to work inside a jet engine. He is Harold Kirkendall, 31, who is employed by General Electric Company's Lockland plant. Kirkendall is only 47 inches tall. His small size enables him to crawl inside afterburners to make general inspection. In this photo (*right*) young Mr. Kirkendall (sitting in the engine) discusses an inspection problem with Jerry Mefford, an engineering supervisor at the plant. GE-built jet engines power many of the fighters, bombers.

CESSNA 195, owned by Amis Brothers is shown here over Boulder Dam, Colo

By a Dam Site

By DON ARMSTRONG

Construction Company builds flight strip first; then it builds the dam

"When we build a new dam, the first thing that goes in is a flight strip. Then we go to work and organize the rest of the job."

That's how the Amis Brothers of Oklahoma City utilize their three Cessna 195 executive transports.

W. D. "Bill" Amis, co-partner in this big-time construction company explains it this way. "The most critical period in any multi-million dollar dam construction is the first six months. At the start of the job you must have your project superintendent, the engineering staff and the equipment supervisors on hand to estimate exactly what's going to be needed.

"Since these key men may be working on a half-dozen different jobs scattered all over the country we have to use our airplanes to get them together for on-the-job conferences."

Typical of the pay-off of company aircraft is the construction job now under way at Falcon Dam, midway between Brownsville and Laredo, Texas, on the Rio Grande. Here the flight strip is right near the headquarters building. The dam itself will be five miles long, 135 feet wide at the top and 1,000 feet wide at the bottom. It will make a lake 40 miles long with a surface of 114,000 acres of water to be divided equally between the United States and Mexico.

This project is being built by the Amis Construction Company and six other big construction contractors. Eighteen million dollars is involved and the

AMIS CONSTRUCTION CO. owns and operates three Cessna 195's which are based at the Oklahoma City Downtown Airport

project will take three years to complete. Early in the project, the value of the 3,000-foot dirt flight strip began to show.

A 30-man crew was driving piling to divert the river when the supply of metal shoes that fit on the bottom of the piles was suddenly exhausted. Replacements had been ordered, but were enroute by slow surface transport, and the 30 men were completely tied up. E. R. Morris, the Amis company pilot, was on the job with a supervisor at the time and immediately flew to Brownsville to pick up additional 'pile points." The 30-man crew was back at work before noon.

The company Cessnas have hauled reinforcing steel clips to complete a bridge in Kenton, Oklahoma, Cooper Bessemer diesel engine parts from the air freight terminal at Wichita to the Cedar Bluff Dam at Ellis, Kansas, and endless small parts —magnetos and injectors for diesel engines—to keep the jobs rolling.

When bulky cargo is carried in the Cessnas, the back seat is removed and a rubber mat placed on the floor. A special frame goes around the radio and ADF equipment and leaves a flat floor for freight.

"However, most of our aircraft time goes into hauling key personnel," explained the other half of the team, Rufus T. Amis. Each brother has his own Cessna 195 and the company pilot, E. R. Morris, flies the third airplane. "Since our dam construction jobs are invariably located way out in isolated country, the only way we can get our key men to the job is by air. The commercial airlines can't do the job because of out-of-the-way landing sites. Frequently, we're five or six hours by company pick-up truck from the nearest airline terminal, and even getting our men that far involves changing planes and airlines.

"We don't particularly worry about what our airplanes cost us. We just know that we can't get along in this business without those planes. Our Cessnas are just as important as the trucks and power shovels."

A rather unusual communications set-up is used between the company Cessna and the pick-up trucks used by on-the-job foremen. Each big job has a headquarters which includes a two-way VHF radio station. This way both the foreman and the aircraft can talk to each other. This company uses Motorola VHF radios on 30.62 megacycles. In addition a walkie-talkie on the same frequency is carried for ground usage where the trucks are not radio-equipped.

Typical of the way this unit saves time—and money—was the flight by E. R. Morris north from the company purchasing office in Monterey, Mexico. His arrival at the Falcon Damsite was late in the afternoon, yet he wanted to make a set of aerial photos and still get his passengers on into Oklahoma City without after-dark flying. He radioed ahead to have the photographer meet him at the strip, together with the U.S. Customs man who works with the construction firms at the dam. He was able to clear his incoming passengers through Customs, take the photographer over the job, land and pick up the remainder of the group and get into Oklahoma City before dark.

While the Amis pilots occasionally fly after dark when they are coming in from a long trip, they don't make a practice of round-the-clock operation in single-engined equipment. Their record is accident free to date and for good reason—they're careful.

Since there is a temporary bridge across the Rio Grande at the site of the Falcon Dam, both U.S. and Mexican Customs officials work directly with the contractors to expedite travel on both sides of the border. The dam contract specifies that a percentage of all material and labor must be purchased south of the border—so there is considerable traffic across the river. Then, departing (*Continued on page 50*)

ENGINEERS of the Amis Co. are flown from jobs scattered over the country to new project for estimate meetings

NIGHT STRIKE coming up, Marine night-fighter pilot in a *Corsair* gets set for take-off from Kimpo Airfield. Target is enemy convoy on mountain road in Korea. *Corsair* is armed with rockets under wings, and wing guns loaded

Night Strike

By Lt. R. E. OLIVER, U.S.M.C.

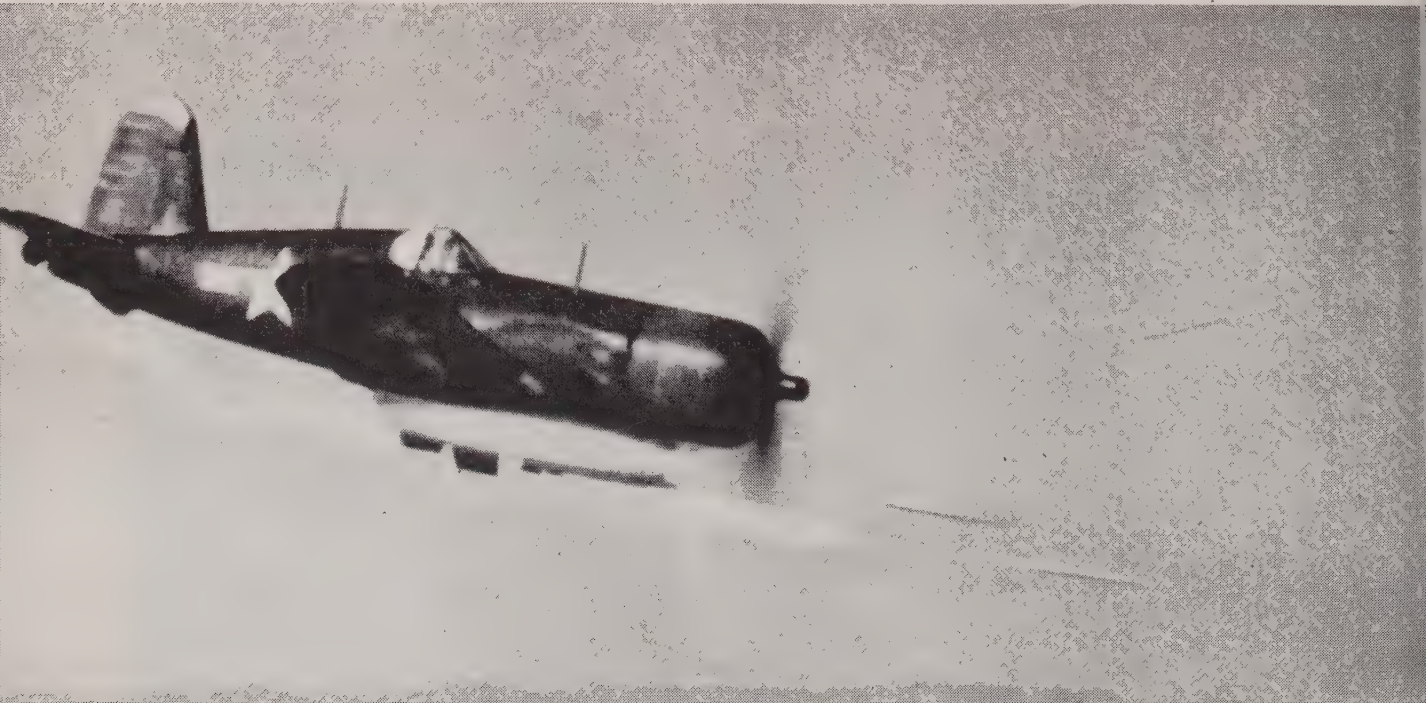
The shrill cry of a cheap alarm clock shatters your warm sleep. This is the first note, the prelude to every night strike.

You fumble in the dark, groping for the little monster with the big voice. Finally, you grab it and now all's quiet, except for the deep, even breathing of half a dozen roommates who have already flown the 'black' or who will be going in an hour or so. Sitting up on the edge of your cot, you feel the weight of your sleep dragging you back to the warmth of your dreams.

You fumble into your socks and shoes, then your electric flight suit. Your eyes grow accustomed to the darkness as you slip into your 'Mae West.' The rattle of your survival compass against your hunting knife causes muffled breathing and a cough from the rear of the room. You've forgotten your shoulder-holstered '.38' and as you take off the 'Mae West' and slip on the 'trouble maker' you mumble a word about its uselessness. Dressed now, your pen-light stabs into the darkness as you check: "Maps, gloves, knee-board, cigarettes, matches, and where in the Hell did I lay my helmet?" Now you've found it. You shuffle toward the door and outside the hut.

The bitter cold smacks you hard and bites at your face. From two huts away, you hear your name mumbled and you know by the shuffle of feet that

CORSAIR PILOT fires "Ram" rockets at enemy tanks and armored vehicles. Night-fighters approach target at altitude of 10,000 feet. Lead plane drops flares, then the second *Corsair* makes pass, followed by lead-plane pass



your strike leader is awake, figuratively speaking. "Cold," he says. "Yeah," you answer.

The jeep is running now. You nod and hang on. The crunch of the ice under the wheels tells you it's still bitter cold and it's not likely to change any time soon. In front of Base Operations, the faint glow of light from the Control Tower glistens on the snow from a week ago. You stumble upstairs to the briefing room and a sleepy-eyed captain yawns and begins with . . . your mission number . . . tar-

AUTHOR Marine pilot, Lieut. Roy E. Oliver, is shown here with Mrs. Syngman Rhee, wife of Korea's President

get area . . . weather and rescue units . . . report in to Destruct Able, and ends with "they'll assign you to your area . . . any questions? Get your flight off on time." He'll go back to sleep, you tell yourself. Tough.

Back in the jeep and through the cold to your squadron line shack, you check the inky black sky. A star or two tells you the weather boys are close, not bad and not good. Inside the shack you sign the yellow sheet for your plane and mark yourself 'Out' on the flight board. Your plane captain yawns and pulls on a parka. "Let's go, lieutenant."

As you clamber up the side of your plane and into the cockpit, the cold wind bites at your face again and your feet are already cold from the sweat.

FIRST MARINE Aircraft Wing *Corsairs* operate out of Yonpo Airfield to attack the Chinese Commies near Hamhung

Damn shoe-paks, you think. Your plane captain helps you into your 'chute and you check: "shoulder straps, safety belt, radio cords."

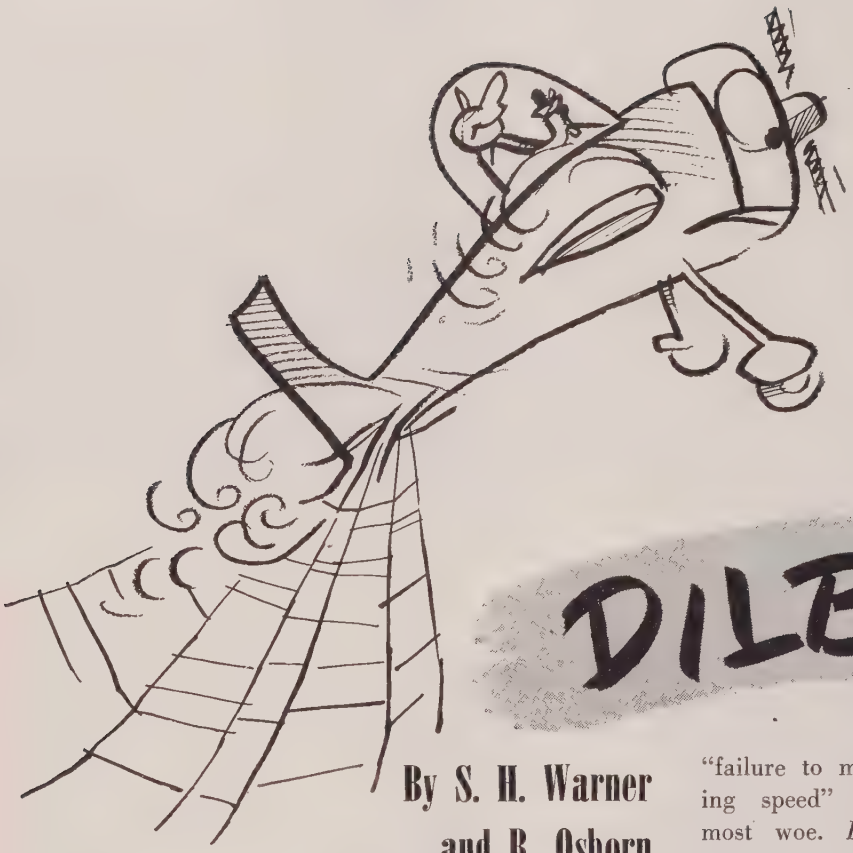
"Yeah, I'm all set, thanks," you mumble.

"Good luck, lieutenant."

Your plane captain slips from sight. You shut the cockpit enclosure to stop the wind. Your eyes stop smarting and you reach for the battery switch. Flick! Your running lights play on the snow around you and silhouette your plane huddled against the wind. The soft red lights inside the cockpit fill you with a false sense of warmth. Fuel selector on, mixture in idle cut off, throttle cracked open, three long shots of prime and you look out at the yellow night wand, holding an 'up.'

Switches on and the prop grinds through, slowly at first and then faster until you feel the engine take deeper breaths—it coughs, then smoothes out to a steady beat as it warms. (*Continued on page 52*)

LEATHERNECK ground crewmen at advanced base hang bombs and rockets on a *Corsair* for night attack on Commies



He stalls, also does he spin

DILBERT

By S. H. Warner and R. Osborn

Let's Face It—I'll give you one guess as to the primary cause of most crashes as listed in the latest aviation accident report issued by the Civil Aeronautics Board. Right you are—Pilot Error.

Let's face it, as long as human beings are responsible for the operation of aircraft, the human element will continue to head the list of accident causes. The only way to whip this is to cut down on the number of accidents. And that, boys and girls of the skyways, is exactly what you did last year. There were fewer accidents in almost every category than in the preceding 12 months. Congratulations!

Do it some more. The best way is to cut out the unnecessary, senseless type of accident; the kind caused by carelessness, lack of planning, and poor judgment. The wreckord shows that violations of flight regulations were involved in a large percentage of the serious accidents. Reckless flying and continuing VFR into unfavorable weather are two more categories that could, and should, be completely wiped out.

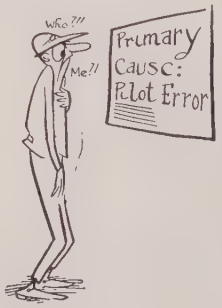
As regards flying technique, "failure to maintain flying speed" causes the most woe. *Don't stall!* Which brings to mind the pilot we used to kid about his fast approaches. One day he floored us with, "Well, this ship stalls at 57. I always add on a few knots for my own safety. Then I add a few more for the wife and kiddies."

Sure it's fun to fly, but it's a game that requires all-out attention from each contestant.

Don't Change Your Mind—Dilbert is in the hospital again; this time with two busted legs. When you hear how he did it, you will agree he was lucky they didn't take him to the place where they use cold marble slabs for leg braces.

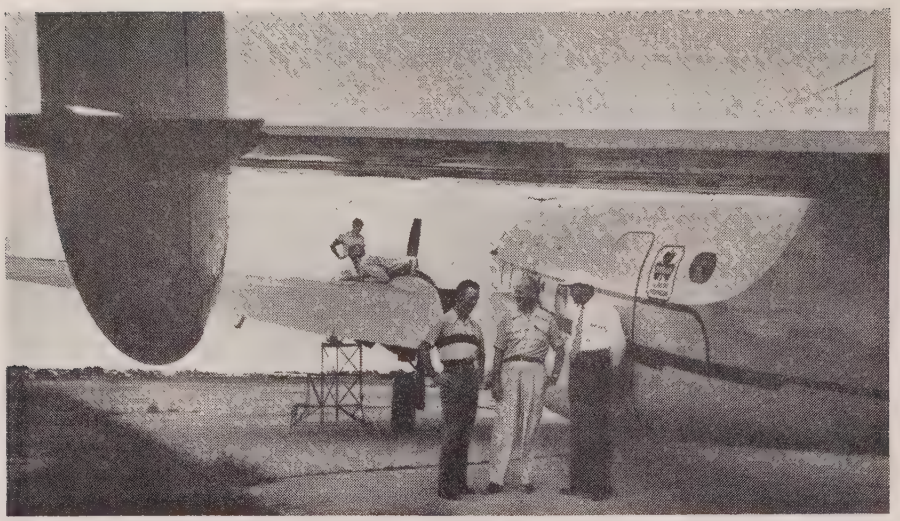
He was at 5,000 feet in a lightplane when his engine conked out. He decided to ride the plane down. So far, so good. At 800 feet, however, Dilbert changed his mind and decided to jump. By the time he got clear and pulled the rip chord, he was much lower. His chute blossomed just before he hit.

A second later and Dilbert would have been a statistic. When you are faced with a forced landing, you—and you alone—must make the decision whether to jump or ride her down. And usually, you don't have much time to procrastinate. If it looks like a jump, make up your mind and get out while you still have plenty of altitude.

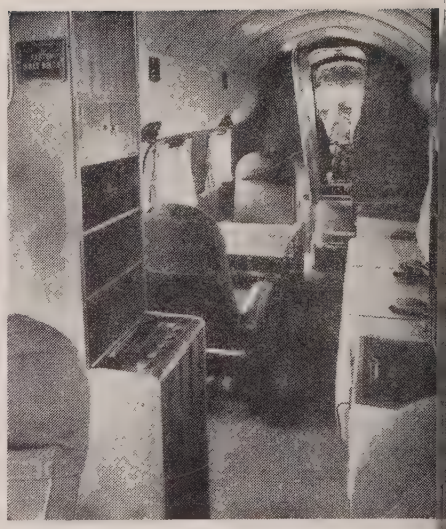


In Dilbert's case, he probably would have been all right either way. But he had to bolix (*Continued on page 58*)

"Salmon go upstream together . . . . . Dilbert does it alone!"



MECHANICS make final adjustments on an engine as the Shamrock Oil & Gas Company Lockheed *Lodestar* sits on ramp at Southwest Airmotive. In pre-flight chat by the cabin door are *(left to right)* Co-pilot Mark Williams, Pilot F. M. Johnson, Co. Secy. F. Wallace



CABIN of *Lodestar* seats nine: six reclining chairs are grouped in two's, a divan seats three. Bulkhead cabinets are walnut

SKYWAYS for BUSINESS

News notes for pilots and owners of the 8,000-plus airplanes for business

Shamrock Oil & Gas Co. Gets Newly Converted Lockheed Lodestar

Shamrock Oil & Gas Company of Amarillo, Texas, is the proud possessor of a newly converted Lockheed *Lodestar* that offers extreme comfort in air travel as well as quiet elegance in decor. All the work was done by Southwest Airmotive at Dallas, and Southwest is deserving of praise for its job well done.

The cabin of the *Lodestar* carries nine passengers: there are six reclining chairs in groups of two, each pair with a removable table, and a divan that seats three. A Craftsman custom radio was installed in one of the two cabinets Southwest made to serve as the center bulkhead in the plane. Used with a special 50-watt amplifier, this radio may be heard in flight clearly and easily above engine noises. The cabinets are hand-finished walnut and plastic. A spacious galley is located between the cockpit and the cabin. In the aft section of the cabin is a lavatory.

Design of the cockpit of the Shamrock *Lodestar* was based on 1) suggestions by the pilot, 2) type of flying to be done by the plane in its future business missions. The main and overhead radio panels provide full VHF and MHF navigation and communication control, plus ILS and an intercom system. A single-piece instrument panel permits the autopilot to remain in position in the center. Flight instruments are directly in front of both pilot and co-pilot, and engine instruments run along the top of the panel, with fuel gages, etc., on the co-pilot's side.

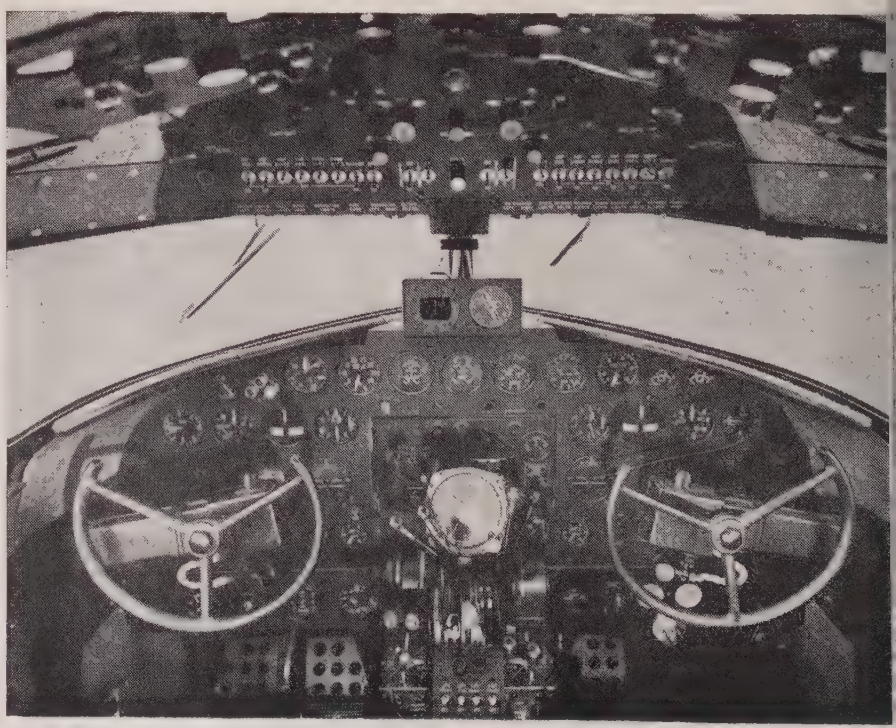
The Shamrock Oil & Gas Company insignia is on the fuselage just aft of the cabin door. Pilot of the plane is F. M. Johnson, with Mark Williams, co-pilot.

'Copter Aids in Building of Advertising Signboard

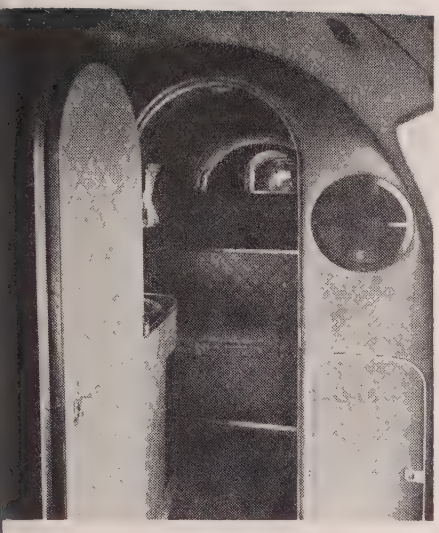
Helicopters have been used for many things but it wasn't until recently that these versatile craft were used as workhorses in the advertising field to construct a signboard 120 feet long by 30 feet high.

At Secaucus, New Jersey, over 25,000 pounds of steel girders, sheet metal panels, sand, gravel, water, cement and tools were shuttled in by New England Helicopter Service of Hillsgrove, Rhode Island.

Problems to be overcome in this construction job included transporting the materials over a swamp, further complicated by high tension electric lines, to get the material to a rocky island some distance from solid ground. Surface transportation was ruled out, and so the R. C. Maxwell Co., of Trenton, New Jersey, contacted Leon Plympton president of the 'copter firm.



INSTRUMENT PANEL of Shamrock *Lodestar* was designed according to pilot preference. Overhead and main radio panels provide full VHF, MHF navigation and communication control, plus ILS and intercom. Autopilot is in center panel position. Conversion was done by Southwest Airmotive, Dallas



AFT SECTION of *Lodestar* cabin is lavatory. Wash basin is inside door at left; below it is water tank. Note semi-circle mirror

At the start of the operation, round trips took 8 minutes, but by the time the job was half completed, this time had been lowered to about two minutes. Seventy loads were required to complete the task.

The signboard which previously occupied the location was built 20 years ago and required the services of men and mules. At that time the project took three weeks. The helicopter service made it possible to do the job in about one day.

University of Illinois Air Service Averages Two Business Flights Each Day

An average of two trips a day for every day of last year were made by the Charter Air Service of the University of Illinois Institute of Aviation to take people on university business. According to a report by Director Leslie A. Bryan, the 723 flights that were made covered a total of 231,935 actual miles and 417,260 passenger miles. The flights were made with the university's own fleet of 5 planes operating from the University of Illinois airport.

Prime user of Charter Air Service was the Division of University Extension with 202 trips. The University's Athletic Association arranged 97 air trips to contests. Other frequent users were the Child Psychology Clinic, College of Education, School of Music, Bureau of Research and Service of the College of Education, Division of Communications, and Alumni Association.

Director Bryan reported that the increase in passenger miles over preceding year was small because of a shortage of staff pilots. In one month alone, 22 requests for charter service were turned down because no pilot was available. To answer this problem, another pilot is being added to the staff.

O'Brien Joins Garrett

Jack O'Brien, formerly president of California Eastern Airways and a 14,000-hour pilot, has joined The Garrett Corporation of Los Angeles. O'Brien will serve as company test pilot.

. . . in the Corporate Hangar

Cornell-Dubilier Electric Corporation's Twin-Beech is now back in service after an engine change and 1,000-hour inspection. Larry Muller is the C-D plane's pilot, and the maintenance work on the Twin-Beech was done by Atlantic Aviation at Teterboro, N. J.

Champion Spark Plug Company's Twin-Beech boasts a completely new radio system which includes ARC VHF equipment, an ARC Isolation Amplifier, a new Bendix Marker Beacon receiver, and a custom-designed control panel. Plane's pilot is Fred Morrison.

Libby Owens Ford Co., Toledo, Ohio, has added a plush DC-3 to its hangar. Fleet now consists of Twin-Beech and the DC-3. Pilots are Tracy Service and Claude Hoover. Qualitron Inc., did the radio set-up, featuring dual ADF's, RA-10 range receiver, Bendix TA-17 HF transmitter, Collins Omni and VHF transmitter, and AM/FM cabin radio. Interior of the plane features an interesting combination of leather and formica. Galley is electrically controlled. Additions to pilots' "front office" include Sperry Zero Reader and Gyrosen compass, electropane windshield. Engines are Pratt & Whitney R-1830's. The plane will seat 12. Exterior features two-tone blue paint job with white top. AiResearch did the conversion work.

Fairbanks, Morse & Company has a converted PV-1 *Ventura* which features picture windows, ship-to-shore telephone, electric buffet, etc. Panel includes Sperry Zero Reader and Gyrosen compass, Sperry A-12 Auto-pilot. Extra fuel tanks increase plane's capacity to 1400 gallons.

Huntingburg Furniture Company, Huntingburg, Indiana, had its Beech D-18-S in the Roscoe Turner Aeronautical Corp. hangar for 1,000-hour inspection recently. At that time an ARC VHF transmitter and receiver, Omni, and a Lear Autopilot were installed. Jim Hopkins is the company pilot.

Jerry Fairbanks, TV and motion picture producer, recently had a Lear Autopilot installed in his Twin-Beech. Installation was done at Qualitron's Burbank, Calif., shop.

B. F. Goodrich's Lockheed *Lodestar* is at the Babb Company hangar at Newark Airport, N. J., for modification. The plane's gas tanks are being stripped and re-sealed, the landing gear and actuating cylinders are being overhauled, exterior of the plane is being re-painted, and the interior is being re-done with the Goodrich Avtrim material. "Front office" alterations include rewiring of present radio innstallation, installation of some new radio equipment and a completely new instrument panel. Plane should be ready for delivery to Goodrich by middle September.

George M. Brewster's DC-3 is in the Babb hangar for 100-hour inspection and repair of damaged wing tip and aileron.

Bill Clark should have his new C-35 *Bonanza* by now. This will be his third. He uses the plane for air trips from Indianapolis, Indiana, to Asheville, N. C., and hasn't missed a trip because of either equipment or weather for two years.

Al Ewing recently flew a CAA Twin-Beech into Indianapolis from Alaska for an engine change and 100-hour inspection at Turner Aeronautical.

Signal Oil & Gas Company had its radio equipment re-worked and edge lighting installed on control panels. Work was done by Qualitron at the Lockheed Air Terminal.

Pinky Grimes, pilot for Stokely Van Camp Company's Twin-Beech, flew into Indianapolis (Roscoe Turner Corp.) for discussion of equipment on the new Twin-Beech the Stokely Company expects soon. With Pinky were Russ Ratts, co-pilot-mechanic, and Fred Summers, head of Aviation Board of Indianapolis.

Dick Harrington, National Literary Association, is having Narco Omnigator installed in his new C-35 *Bonanza*.

CAOA REPORT . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 1025 Connecticut Avenue, Washington 6, D. C.

New Members

The following new members have been accepted by the Board of Directors since the annual meeting and Forum in June.

Esso Shipping Company, New York, is a subsidiary of the Standard Oil Company of New Jersey, and is engaged in petroleum transportation. The aviation division, and/or affiliated companies, has owned and operated aircraft as an aid to business since 1927, and presently operates a considerable fleet of aircraft in various parts of this country and overseas. Colonel E. W. Estelle is manager of the aviation division, and Robert E. Ellis is assistant manager.

New York Wire Cloth Company, New York City, manufactures insect wire screening, and operates a Lockheed *Lodestar*, Beechcraft D-18-S and a Ryan *Navion*, all based at Teterboro, N. J. W. S. Cranmer is secretary and Stanley C. Smith is the chief pilot.

Associated Aviation Underwriters, New York City, operates as the aviation department of 61 insurance companies in their group. General manager is D. de R. M. Scarritt, New York, and the representative at CAOA meetings will be William W. Walter, manager of the Dallas branch. E. L. ("Steve") Stephenson, manager of the Chicago branch, has attended several CAOA Forums and has been very much interested in the growth of our Association. There are seven pilots with commercial ratings in the organization. It operates a *Navion* 260, Cessna 170 and two Cessna 140's, based in various parts of the country.

Rowan Oil Company, Fort Worth, Texas,, is engaged in oil production, and operates a Lockheed *Lodestar*. An affiliated corporation (Rowan Drilling Company, Inc.) operates a Grumman *Widgeon*, based at New Orleans. Peter H. Carney (ATR) is chief pilot.

The Lubrizol Corporation of Cleveland is engaged in the manufacture of petroleum chemicals. The corporation operates a Beechcraft D-18-S and a Cessna 195, based at Lost Nations Airport. D. M. Blanche, traffic manager, will be CAOA representative, and William F. McNeeley and Nicholas Schemensky (General Aviation, Inc.) fly the aircraft for the corporation.

Quaker Rubber Corporation of Philadelphia is a division of the H. K. Porter Company, Inc. of Pittsburgh. The corporation is a manufacturer of industrial rubber goods and has recently acquired a Lockheed PV-1 *Ventura*, based at Allegheny County Airport. CAOA representatives are T. M. Evans, president, or J. M. Shoffner, assistant to the president. George W. Knight is Washington district manager. A. P. Wagner (ATR) is the chief pilot.

Vincent & Welch, Lake Charles, La., are oil producers and developers and have operater aircraft since 1945. Present equipment consists of a Douglas DC-3 and Beechcraft *Bonanza*. Chief pilot is John R. Henry (ATR).

Brown-Graves Company of Akron, Ohio, is engaged in the manufacture of lumber, sash, doors, and architectural millwork, and operates a Beechcraft D-18-S. H. E. Graves, Jr., is secretary of the company and Ted Byron (ATR) is the pilot.

Phillips Drilling Corporation, San Antonio, Texas, is engaged in the oil business, operating a Douglas A-26B and a Beechcraft C-35 *Bonanza*. The *Bonanza* averages better than 800 hours per year. George W. Vaughan (ATR) is chief pilot, and Robert L. Donnell (ATR) is a company pilot.

Arute Brothers, Inc., General Contractors, New Britain, Conn., operates a Douglas DC-3 and Ryan *Navion*, based at the Canastota Municipal Airport, N. Y. Jack Arute is president and CAOA representative, and Roger A. Carley (ATR) is chief pilot.

General Motors Corporation, Detroit, operates a fleet of multi-engine and single-engine aircraft in connection with the operation of the corporation and its various divisions. Several of them are based at Detroit City Airport. E. Tilson ("Til") Peabody is manager of aircraft operations, and J. A. Sarason is assistant comptroller.

J. P. Stevens & Company, Inc. is in the textile business, with offices in New York and mills in South Carolina. The corporation operates two Beechcraft D-18-S airplanes based at Greenville (S. C.) Municipal Airport. Ralph H. Cuthbertson (ATR) is chief pilot.

Electrical Information Publications, Inc. of Madison, Wisconsin, operates a Cessna 195 and a Cessna 170 in connection with its publishing business. W. M. Fraser, commercial pilot, is the business manager and will represent EIP at CAOA meetings. Fento Kelsey, Jr., is president of the corporation.

Falstaff Brewing Corporation of St. Louis operates a Lockheed *Lodestar* based at Lambert-St. Louis Airport. Its up-to-the-minute functional type instrument panel and overhead cockpit layout (see July SKYWAYS CAOA Report, p. 44) was designed by Ralph E. Piper, chief pilot of Monsanto Chemical's fleet of multi-engine aircraft, and is also being incorporated in other company aircraft conversions. H. J. Pettey is assistant secretary and general traffic manager of Falstaff Brewing, and B. N. Haddock is chief pilot.

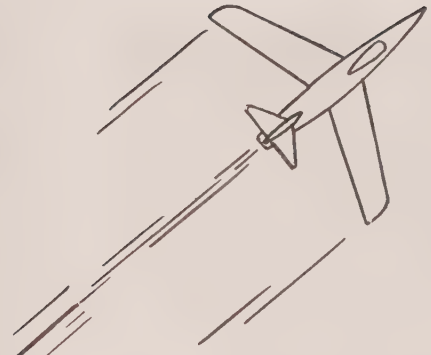
Plains Machinery Company, Inc., Amarillo, Texas, manufactures industrial road machinery and equipment. The corporation has operated aircraft as an aid to business since 1940 and currently flies a Beechcraft A-35 *Bonanza*. H. V. Tull, Jr., is president and Arthur L. Chase is the company pilot.

Acceptance of this group brings the mem-

(*Continued on page 41*)

DE HAVILLAND DOVE, British-built executive transport, is becoming increasingly popula Thus far, 12 companies have ordered *Doves;* six others already have taken deliver

AERO COMMANDER ESTABLISHES



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- Non-stop from Oklahoma City to Washington, D. C.
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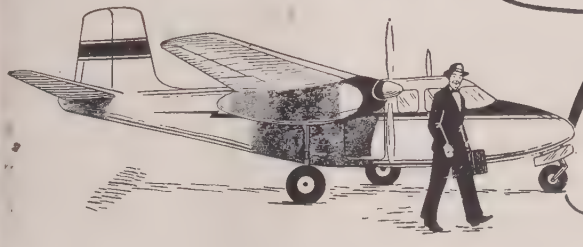
- 13.6 gallons per hour.
- 147 miles per hour.
- Pioneering a new era in twin engine safety.



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New Coat

A new type of protective coating which preserves metal or fabric surfaces against corrosion and weather is being marketed by Van Dusen Aircraft Supplies of Minneapolis, Teterboro, N. J., and Boston. Called "Surf-Pro," the coating is a clear plastic which is sprayed on the wings, fuselage and other parts of the airplane. This application leaves an invisible film on the surface which adds shine to the finish and makes it impossible for dirt and grime to penetrate. One application can be expected to last several years. "Surf-Pro" was developed by Dr. T. N. Dodd, Jr., of the Dodd Chemical Corp., Little Ferry, N. J., and is distributed nationally by Van Dusen.

Safety Award

Trans World Airlines recently received the National Safety Council's award for flying more than four billion passenger miles with a perfect safety record. Ralph S. Damon, president of TWA, pointed out that the more than four-billion-mile record is equivalent to one passenger flying in perfect safety more than 176,000 times around the world at the equator . . . or, making more than 6,105,000 non-stop trips between Chicago and New York.

Computers

In the past two weeks, two new computers and a plotter have showed up which hold a great deal of promise for all pilots. One computer is especially for lightplane pilots, while the other computer is for pilots and/or navigators of all aircraft.

The *Driftabulator* is for the lightplane pilot computing drift and speed correction. Actually, the *Driftabulator* is a table of drift correction angles, and resulting speed components in units of 10 miles of wind speed and 10° of relative wind from 10 to 170°. With the *Driftabulator*, the pilot can determine his true heading and ground speed by simple addition and subtraction. Average readings are within 1 to 1½° of the theoretically correct values . . . close enough when you realize that the average lightplane pilot cannot steer within 2° of the course. The gadget has been designed to fit inside the mileage scale of the Weems Mark 11 plotter. There are four *Driftabulators* available covering the speed ranges of 81 to 94 mph, 94 to 110 mph, 110 to 135 mph, and 135 to 180 mph. The *Driftabulator* is being marketed by Widger-Pitman Associates, New York, N. Y.

The *Batori Navigational Computer* is really the "something new" in computers. The Batori computer is unique in the wide range of speeds it covers and is unlike other computers in the fact that it can deal with winds of any velocity without extra mental calculations or supplementary graphs. The Batori computer is extremely accurate, particularly in the computation of true airspeed in which allowance is made for compressibility heating. A study of this computer as against others has proved that the Batori, at 400 knots (460 mph), is 26 knots (mph) more accurate than other standard instruments. Features of the Batori computer include a "window" for setting speeds and fuel consumption plainly and unmistakably. The figures and letters are sharply engraved with enamel fillings. Actually, the Batori computer does everything but fly the plane. Its special applications include calculation of winds for pressure-pattern flying and pressure-pattern drift measurement; density altitude for most economical engine performance; computation of the critical point during a flight after which it will be quicker to go on to destination rather than turn back; point of no return, plus all other dead reckoning problems: time, speed, fuel consumption, true height above sea level or airport, ETA in hours and minutes, etc. In addition, the computer is excellent for converting Statute miles to Nautical miles, Fahrenheit to Centigrade, knots to miles per hour, miles per hour to feet per second, etc. The Batori computer is made of aluminum, is spring-loaded, won't warp or crack, resists salt and fungi, can't stick or slip, and it fits into your pocket. On one side is the Navigational computer, on the other side the Vector computer for drift measurement, etc.

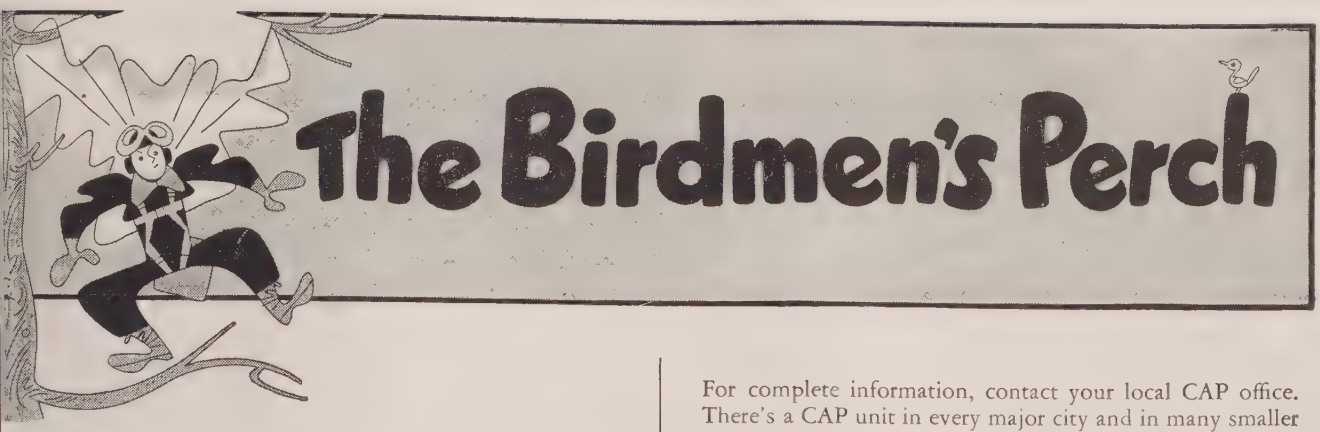
COMPUTER designed to "do all" for executive and military pilots is this aluminum Batori

Companion piece to the Batori Computer is the Anderson Plotter for chart work. It measures bearings and plots courses from meridian or parallel, clearly indicates all directions, gives quick heading corrections, plots position lines for radar navigation and astro navigation, and plots parallels and vectors at right angles. The only problems these two, the computer and plotter, won't solve are strictly those in the A & E's department. The Batori Computer Co., Inc., is in New York.

AIA REPORT for June '51 shows shipment of 208 airplanes by four reporting companies

	Complete Aircraft			Manufacturer's Net Billing Price		
	Shipments			Shipments		
	TOTAL Jan-Jun	June	May	TOTAL Jan-Jun	June	May
				(thousands of dollars)		
Aeronca						
Champion 90 hp	10	--	1			
Sedan	18	--	1	89	--	6
7CCM[a]	2	--	--			
Beech						
Bonanza	195	36	40			
D-18	34	6	6	4,445	796	824
Cessna						
140A	37	1	1			
170A	231	46	33	2,142	304	436
190	13	4	3			
195	47	--	12			
Engineering & Research						
G	6	--	1	20	--	3
Luscombe						
GC-1B	8[b]	--	1			
8F	19	--	1	87[b]	--	7[c]
Mooney - M-18	12	--	3	21	--	4
Piper						
Tandem Trainer	280	48	46			
Pacer	386	66	80	2,315	438	449
Clipper	1	--	--			
Ryan - Navion	104	--	2	1,215	--	27
Taylorcraft						
Sportsman	8	1	1	17	3	3
TOTAL	1,418[d]	208	232	10,418[d]	1,541	1,759

a/ Military type aircraft sold to other than U.S. Military Customers.
b/ Includes 7GC-1B's valued at $27,000 shipped by Texas Engineering Corp.
c/ AIA estimate
d/ Includes 7 Cruisemasters valued at $67,000 shipped by Bellanca.



Leave us have a fanfare, Ferdie!

Today we are beating the drum for that august organization, the Civil Air Patrol.

We don't have to tell you about the many and important jobs it did in the last war, or the vital part it's slated to play in the event of another war.

The CAP needs new members, especially private pilots, but also anyone interested in aviation or allied subjects such as radio or meteorology.

You'll be doing your Uncle Sammy a big favor, as well as letting yourself in for some highly interesting activity, by signing up *now!*

For complete information, contact your local CAP office. There's a CAP unit in every major city and in many smaller cities and towns.

WHAT? IN THE SHOP AGAIN?

Maybe you didn't hear us the first time, Buster, but there's a cure for those "overhaul blues"!

It's Gulfpride Aviation Oil—Series D—the finest detergent dispersant oil for horizontally opposed engines there is!

Gulfpride Aviation Oil—Series D—is the only aviation oil put through Gulf's exclusive Alchlor process to remove those extra carbon and sludge formers. It will increase those periods between overhauls up to *100%!*

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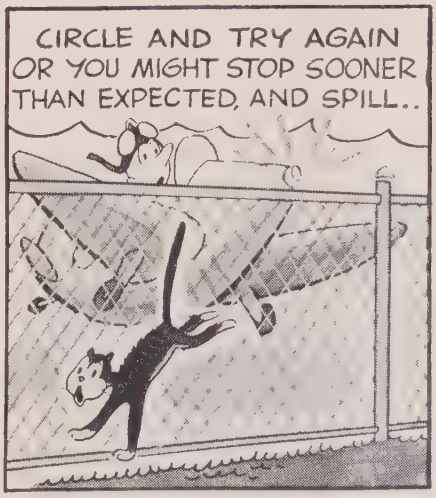
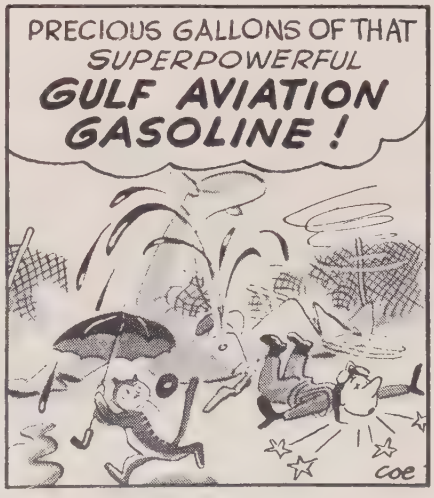




Gulf Oil Corporation . . . Gulf Refining Company

Soviet Jet: Tu 10

(*Continued from page 13*)

place to the development of tactical machines intended for the direct support of the all-important Red Army.

The immediate post-war need was modern jet fighters for the internal defense of the Soviet Union and to provide top cover for ground formations. With this need assuaged by the MIG-15 and La-17, prime attention was switched from fighters to the development and production of equally modern attack bombers. The first evidence of Russia's preoccupation with tactical jet bombers came in August 1947 when, in a fly-past over Tushino airfield, two different jet bombers made their public debut, much to the gratification of the assembled Muscovites.

One of these aircraft was a twin-jet machine designed by Lieutenant General Andrie N. Tupolev, doyen of Soviet bomber designers, and obviously derived from his successful Tu-2 bomber of wartime vintage. The other was a four-jet machine from the drawing board of Lieutenant General Sergei A. Ilyushin which displayed obvious traces of German ancestry. Both of these machines were comparatively small, obviously intended for the tactical role and, equally obviously, hastily produced prototypes.

Neither machine reappeared. The Tupolev design, utilizing the wing, rear fuselage and empennage of its piston-engined forerunner, was probably an engine test-bed for the next attack bomber from that stable. The Ilyushin design is believed to have undergone intensive development over the past few years and reports indicate that Ilyushin, with the assistance of Sigfrid Gunther, late of the Heinkel concern, has produced a more advanced version powered by two large axial-flow turbojets in place of the four low-powered Jumo 004 units installed in the prototype.

However, it was not until some three years later that jet bombers again appeared in a fly-past over Tushino airfield, near Moscow.

In the May Day fly-past last year, three examples of an entirely new jet bomber made their appearance, indicating that the Reds had at last succeeded in bringing a jet bomber up to an acceptable operational standard. Like many other Soviet aircraft, details of the design origin of this bomber are hazy at the present time. Some credit the design to Andrei Tupolev and label it Tu-10. It is certainly feasible that Tupolev is responsible for the new machine as some external features are identical to those seen on the experimental Tupolev jet bomber that appeared in the 1947 fly-past. Other reports, however, suggest that it is an Ilyushin design, designated IL-24.

Although there is some doubt concerning the parentage of this bomber, there can be no question that it denotes as marked a step forward in Soviet bomber-design technique as did the MIG-15 among Soviet fighters. That the machine is now in full-scale service is evidenced by its appearance in quantity at Oranienburg airfield, north of Berlin. The Soviet Air Staff does not allow its latest machines outside the security of the Soviet Union proper, where they will be the object of prying eyes, unless they possess the aircraft in sufficient quantities.

The new Russian attack bomber appears to compare with the B-57A *Canberra* in both size and functional role. Like the *Canberra*, it represents a stage in transition between the fastest piston-engined bombers and the ultra-modern, swept-wing jet attack bombers now on the drawing boards or in prototype stages. It is thoroughly rational in concept, appears to be a sturdy, workmanlike machine in the best Soviet tradition, and a worthy successor to the Tu-2 for short-range tactical duties.

Externally, the machine does not offer any design innovations, if one discounts the unusual combination of a straight wing and a fully-swept empennage. It spans some 65 feet and the aspect ratio of its wing—approximately 6—is reasonably low. Bearing in mind normal Russian practice, all-up weight can scarcely be of the order of comparable American machines, and it can be presumed that wing loadings are reasonably low.

Like the *Canberra*, it would appear that sweepback of wing surfaces has been deemed unnecessary at the Mach number attainable with turbojets likely to be installed within the bomber's operational life, and in planform the wing has no leading edge taper but sharp taper on the trailing edge which carries the generous split and divided flaps.

The fuselage, measuring approximately 60 feet in length, is of circular section which may indicate cabin pressurization and the suitability of the aircraft for high-altitude roles. Its clean contours are marred by two appendages; a bulge under the forward fuselage, aft of the nosewheel housing, which may house a D/F loop or possibly a radome, and a large tail bumper under the extreme rear fuselage which presumably affords the tail gunner protection in the event of a tail-down or belly landing. The forward fuselage has a generously glazed nose section for th bombardier/navigator who is seated on th nosewheel housing. The pilot's cockpit i placed well forward of the turbojet nacelles and the sharply curved canopy has a slidin section, a front armour-glass panel and rea armour protection.

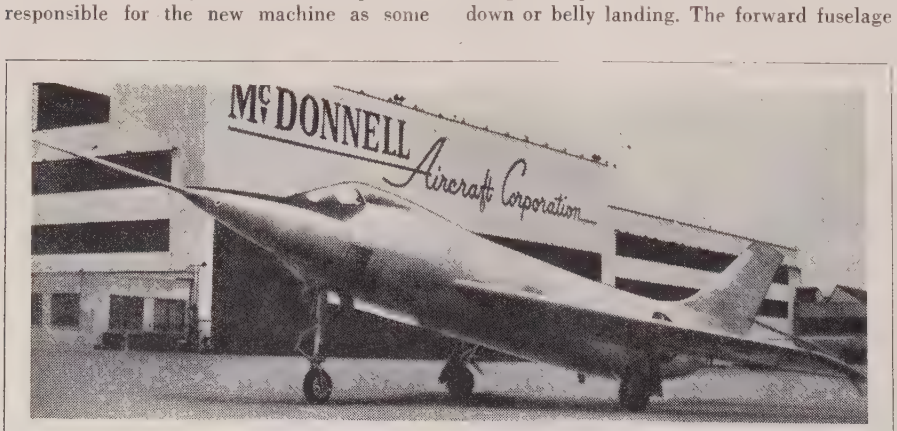
Evidently, the designer was loath to trus the safety of his bomber to its speed an maneuverability as protection from fighte attack as the third crew member is a rea gunner who manipulates a hand-operate twin 20-mm cannon mounting in a turret af of the empennage. Other armament include one 20-mm or 30-mm cannon mounted eithe side of the nosewheel housing. The usefu looking bomb bay is some 17 feet in length the bomb-bay doors are sectioned, the inne sections folding upwards and, with the oute section, outwards to present as little air flo disruption as possible during high-spee bombing runs. Additional racks carryin either bombs or rocket projectiles ar mounted under the wing, inboard of the je nacelles.

All tail surfaces are sharply swept. Th tailplane, which has marked dihedral, ha approximately 40° sweep and is attached t the base of the fin and rudder assembl above the rear fuselage. The main unde carriage members are housed in the large rectangular-section turbojet nacelles, the le retract into slim, offset housings and th single-wheel units appear to turn through 90 to lie flat under the air intakes. The nos wheel assembly is of twin-wheel type an retracts backwards into a fuselage housin under the bombardier's position and enclosed by flush-fitting doors.

As has already been mentioned, the turb jet nacelles are proportionately extreme large. The nacelles measure some 25 feet length, are of rectangular section and a underslung well forward of the shoulde mounted wing. The turbojets installed appe to be of axial-flow type and the size of th turbojet nacelles indicates that the jet uni are also large. The size of the nacelles ma well indicate the use of M-012 axial-flo turbojets (based on the German Jumo 012 which are known to have been develope to an acceptable operational standard. Th M-012 measures approximately 15 feet length and the additional 10 feet of nacel length may be accounted for by an afte burner extension. The M-012 is believed give some 5,000 pounds thrust althoug owing to the large scale use of steel in i manufacture, it is considerably heavier th comparable American axials.

Presuming that the turbojets afford a tot thrust of 9,000 or 10,000 pounds, and pu supposing that all-up weight is little mo than 35,000 or 40,000 pounds, a "guesstimat gives a maximum level speed of from 530 540 mph at sea level. The Russian bomb should not experience difficulty in maintai ing this performance all the way up to t tropopause where a corresponding Ma number of 0.80 looks a conservative lim Cruising speed is likely to be around 4 mph and normal range between 1500 a 2,000 miles.

It is a disturbing thought that, at a ti when the B-57A *Canberra* is just enteri production in the USA, the Soviet Air For should have a comparable machine, althou perhaps less spectacular in performance th its Western opposite, in service with atta bomber units.



MCDONNELL DEMON is Navy's newest experimental jet fighter. Designated XF3H-1, the *Demon* recently made its first flight. It is powered by Westinghouse turbojet engine

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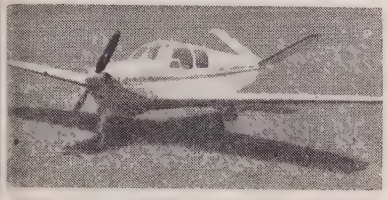


BEECHCRAFT BONANZAS—44 FOR SALE—$6225 UP. New painted unused 1951 model C-35, #97S, has extra tank, gyros, VHF radio, and ADF. Will deliver. $18,500. Also; painted late 1949, model A-35, #8903AS, with low time and extras. $9000. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

GRUMMAN GOOSE AMPHIBIANS—2 FOR SALE—#1907VS, equipped for 7 passengers and crew. New airline interior. Ship, engines, and equipment in top condition. Excellent radio. ADF. No corrosion. Relicensed June. $35,000. For details consult **POWERS & GEORGE.** "Airplanes Everywhere."

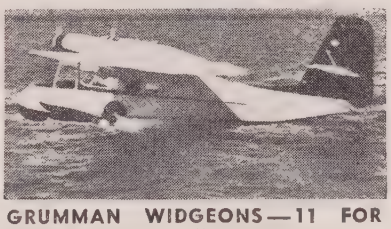
PIPER TRI-PACER—FOR SALE—April 1951, #859AS, has 33 hours. Metal propeller. Primary blind instruments plus gyro compass. Radio. Loop. Hangared. Undamaged. One owner. Brand new condition. $5450. Offer wanted. For complete details consult **POWERS & GEORGE.** "Airplanes Everywhere."

SWIFT 125'S—17 FOR SALE—$1750 UP. 1946, #72076S, has 330 hours. Gyro. Radio. $1850. Also; 1948, #3217KS, with 259 hours. Aeromatic. Gyro. Radio. $2500. Also; 1950, #2836R, with 280 hours. Aeromatic. Extra tank. Gyro. Radio. Bargain. $2800. **POWERS & GEORGE.** "Airplanes Everywhere."

NAVIONS—50 FOR SALE—$4125 UP. 1948, #4705KS, has 205HP engine. 200 hours. Late propeller. Extra tank. Gyros. ADF. Exceptional. $8250. Also; 1949, #4376KS, with 325 hours. Engine 250 hours. Extra tank. Gyros. VHF. Omni-range. $10,250. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

BEECHCRAFT D-18-S TWINS—5 FOR SALE—$43,100 UP. 1946 Executive, #84373S, has only flown 300 hours. Constant speed propellers. Nose tank. Collins VHF radio. Omni-range. ADF. New condition throughout. Exceptional airplane. $55,000. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

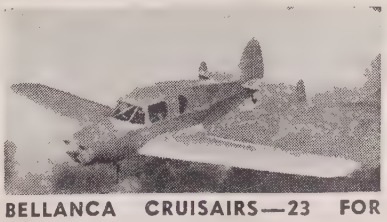
CESSNA TWINS—26 FOR SALE—$1500 UP. #62957S, has 590 hours. Engines and airframe under 100 hours since overhauled. Recovered. All desirable features and modifications. Extra tank. Gyros. VHF. ADF. 4" insulation. Beautiful. $3900. Consult **POWERS & GEORGE.** "Airplanes Everywhere."



GRUMMAN WIDGEONS—11 FOR SALE—1945, G-44, #62282S, has revised hull. 651 hours. Engines 195 hours since overhauled. $10,000. Also; 1947, G-44-A, #80660S, with 550 hours. 2 spare zero engines. Metal props. Gyros. VHF. ADF. $22,500. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

CESSNA 170's—24 FOR SALE—$3000 UP. 1948, #4690VS, has 256 hours. New engine. Metal propeller. Radio. $4000. Make offer. Also; 1949 all metal, #9475AS, with 168 hours. Metal propeller. Primary blind group. Radio. $5200. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

CESSNA 120 FLOAT-PLANE—FOR SALE—1947, #2230NS, has complete electrical system. Upholstered. Factory corrosion proofed. Painted red & silver. Metal prop. Radio. Complete land gear. No corrosion. Relicensed April. Bargain. $1400. Consult **POWERS & GEORGE.** "Airplanes Everywhere."



BELLANCA CRUISAIRS—23 FOR SALE—$2675 UP. Late 1948, #7841SS, has 130 hours. Aeromatic. Gyro. Radio. Beautiful. $4375. Make offer. Also; 1950, #4420NS, with 23 hours. Deluxe equipment. VHF. Omni-range. New condition. $7000. Consult **POWERS & GEORGE.** "Airplanes Everywhere."

AERONCA SEDANS—6 FOR SALE—$2500 UP. December 1948, #1684HS, has 170 hours. New 1950 engine with 30 hours. Metal propeller. Primary blind instruments. Radio. Other extras. Relicensed April. $2800. Make offer. For details consult **POWERS & GEORGE.** "Airplanes Everywhere."

ALL TYPES OF AIRPLANES AVAILABLE—DETAILS UPON REQUEST—LISTINGS SOLICITED

F-94 to Alaska

(*Continued from page 12*)

working. Then walk forward on the throttle and you're in business."

As our speed picked up, Captain Goetz, the flight leader, said, "After-burner . . . now." You could feel the surge as our speed picked up even faster. The after-burner is a blow-torch type fuel-burning system that gives additional thrust for take-off and short periods of emergency climb.

Our take-off was made on a hot mid-afternoon and the jets took most of the runway to break ground. As the ship broke ground and started to climb, I asked Captain Barnes about the length of run.

"No sweat," said the pilot easily. "We had plenty of room and nearly 160 knots (185 mph) over the trees. There are a couple of fields up the line that are tighter than that," he added cheerfully.

Standard procedure for these fighter pilots is to take off and climb in close formation. The reason for this is partly essential practice for the boys' tactical efficiency, and partly "good show" for the taxpayers. And these boys fly a "good show." From this close range the F-94's look like a king-sized Coca-cola bottle with stubby wings added as an afterthought . . . and you don't have to strain your eyes to read any of the small print on the other planes.

The three ships circled the San Fernando valley and began climbing on course. The altimeter hand spun like a fast-running second hand on a watch and we leveled off over Daggett at cruising speed—somewhere around seven miles per minute.

"Navigation in these jets isn't too much different from anything else," explained Captain Johnson as we sped toward Las Vegas. "The main difference is that things happen faster. The new jet charts—six cover the whole United States—are nice, but all of us carry regular old-fashioned strip maps in addition to a radio-facilities chart.

"We normally fly airways in the States—and *always* airways through Canada and Alaska. Between the range stations and the radio compass, we can keep an accurate check of our position, no matter the speed. About the only time that any of us get into trouble is over our home station doing lazy eights or acrobatics at the end of a flight to burn out enough fuel to land comfortably. It is quite easy to drift 30 or 40 miles away from home in just a few minutes. Then you're in a 'bind' because your fuel is about gone. But on a regular cross-country flight, we're never 10 miles from the airway.

"Watch along the way and see how close we hit our ETA's (Estimated time of arrival). If we're more than two-and-a-half or three minutes off, someone went to sleep."

The tight formation was relaxed and the pilots settled down to follow the beam. In cross-country navigation of this type, the flight leader actually does the navigating and makes the radio contacts. However, each pilot has a full set of maps and follows the progress of the flight very closely so that he can take off on his own, should he become lost from the other planes.

There was absolutely no sensation of speed until the weather clouded over and we pulled back into close formation. Then, as the wisps of clouds began to flick by, you really knew you were traveling. There's no vibration, very little noise and the three ships seemed to hang in the air on invisible strings, controlled by a smooth-handed puppetier.

ALASKA-BOUND—In this photo the tail assembly is about to be fitted to an F-94, one of a group ready for delivery to the Alaska Air Force Command. Tails of the all-weather '94's are painted red for contrast against Alaska's snow

No sooner did the three planes form and start climbing in formation than we ran through a thin, wispy curtain of clouds into clear air again.

The Great Salt Lake of Utah rolled into sight and we circled in for a landing at Hill Field in Ogden.

"These F-94's are quite heavy, and they land 'hot,'" said Captain Johnson over the intercom. "We'll probably touch down at about 110 knots (126 mph) at this altitude."

The scenery was streaming by at a terrific clip when the wheels lightly touched the runway.

"This is strictly a brake airplane," said the pilot. "It takes plenty of brake pressure to slow down at all. The average transport-plane runway is barely big enough for a jet."

It was wonderful to get out and stretch. After I complained a bit about being cramped in the back cockpit, Lt. Edward Wnuck of Detroit found me a rubber cushion for the remainder of the trip. I really believe it saved me from a fate worse than death.

At Ogden we joined the other three Alaska-bound interceptors. Their pilots were Captain Joe Wisby of Springfield, Missouri, Lt. Wnuck and Lt. Felix A. "Doc" Blanchard of McColl, South Carolina. Sports fans will remember Lt. Blanchard as "Mr. Inside" of the famed Army football team of 1945-46.

While the jets were refueled, the pilots took on coffee and sandwiches. It wasn't long before we were strapped back in the planes and taxiing out for take-off. The air was cool and "heavy" at Ogden, so the planes broke ground a comfortable distance from the end of the runway.

"No sweat," said Captain Johnson cheerfully as we circled out over the lake and headed on course. Flecks of ice streamed in through the ventilators. "When the moisture content of the air is high, we frequently pick up this type of ice from our own cockpit refrigeration unit," explained the pilot.

"Ice knocks off the paint, and a heavy rain storm will do that, too. From the looks of this cloud deck up ahead, I'll have a chance to show you," he continued.

These Alaskan jets all carry red outer wing panels and red tail surfaces that will show up well against the whiteness of the Arctic in case of a forced landing.

There was a quick minute of instruments and then we broke out in the clear and started to descend toward Great Falls. Even though our take-off time had been nearly three in the afternoon, we landed here in northern Idaho long before dark. Ironically, our route was similar to the old Ferry Division airway that took fighters to Russia during World War II.

It took Captain Johnson seven days—and three blow outs—to drive his car from Great Falls to Anchorage. On his first delivery flight, he made the whole trip in a leisurely day. We started off with six F-94's the next morning to repeat the process, but didn't quite make it.

During a routine post-flight inspection at Edmonton, Canada, a faint burned spot was noticed on the tail-pipe of Captain Barnes' plane. Further investigation revealed a slightly cracked weld that, though not dangerous, should be replaced. By the simple process of matching pennies the pilots decided who would stay and who would continue. Among the pilots who remained was my aerial driver.

"We never fly around this country alone," explained Captain Barnes as we sat around the Canadian ready room. "These airplanes cost roughly $300,000 each. There's no reason to lose one, or have a pilot wind up missing in the wild country ahead just because he was flying alone. Our planes always go out in pairs at least, unless they're in the immediate vicinity of their own home field.

"We'll have to wait here for parts to be flown down from Alaska or up from the

(*Continued on page 42*)

CAOA Report . . .

(*Continued from page 34*)

bership of the Association to over 150 companies, operating well over 350 aircraft.

Aero Commander Flight

The *Aero Commander*, twin-engine executive type airplane, made aviation history when it took off from a standstill position from the Will Rogers Airport (Oklahoma City) and flew non-stop to Washington, D. C. on only one engine.

The flight was made with full gross weight of 4800 pounds, and the single-engine performance was demonstrated to show the safety factor of the airplane for company use. The left propeller was removed to eliminate the left engine as a possibe source of power during the flight.

Dove *Distributor*

Riley Aircraft, located at Gregg County Airport, Longview, Texas (with mailing address at 423 Crockett Street, Shreveport, La.) reports that they accepted delivery on the first de Havilland *Dove* to be certificated in the United States during December 1950. Since then their pilots have flown it in demonstrations, and cross country for the purpose of demonstrations, more than 700 hours.

Here's what they say about it. "The *Dove*, without a doubt, is the smoothest, quietest, most efficient and comfortable airplane it has ever been our experience to fly."

At mid-summer, sales of the *Dove* numbered 12, in locations from California to Florida and from the Great Lakes to the Gulf. Purchasers include oil companies, contractors, bankers and private individuals. Several of the major oil companies are considering adding one or more *Doves* to their fleets.

Companies now operating the *Dove* include Hunkin-Conkey Construction Company, Cleveland, Ohio; Del Webb Construction Company, Phoenix, Arizona; Fullerton Oil Company, Pasadena, California; John Wrather (Oil), Longview, Texas; E. K. W. Andrau (Oil & Cattle), Houston, Texas; E. A. Hall (Banker, Cattle & Oil), Albuquerque, New Mexico.

The operation at Longview consists of a hangar with complete facilities for assembling *Doves*, overhauling engines, and stocking parts.

The Gypsy *Queen* 70-4 inverted in-line engines have flown more than two million operational hours in various parts of the world since 1944, and have proved to be not only quiet and efficient but completely dependable and durable.

Firm deposits of $10,000 each are being accepted against future deliveries, with installation of American-type radio equipment extra. For complete details address Thane Minor, General Sales Manager, Riley Aircraft, Shreveport, Louisiana.

The *Doves* are flown over from England by crews of Fleetways, Inc., an American transport company engaged in ferry work all over the world. Crews returning from deliveries to South Africa and the Far East are ferrying *Doves* for the United States market via Iceland and Greenland; time between Keflavik, Bluie West, Goose Bay and Montreal averages between four and five hours for each leg.

Off to a Good Start!

Headed for interesting jobs under the Airman Career Program are Private Karl O. Engstrom, pictured at left above, from Willmar, Minn., and Private First Class Bob Jones, right, from Yakima, Washington. Recently enlisted, both men's aptitudes and interests showed that they would make good weather observers. Now they are getting the chance.

Sergeant Henry B. Wuenbold, Jr. from Cincinnati, Ohio, is instructing Karl and Bob on use of the Theodolite in tracking hydrogen balloons to determine wind speed and direction at various altitudes.

When Karl and Bob finish training, under instructors like Sgt. Wuenbold, they'll be grounded in the fundamentals of a vital, interesting job with the Air Force.

This same opportunity is waiting for you! **The Air Force has technical schools in 44 career fields. You'll be taught an important job *and you'll be paid while you learn.* As you grow more expert you'll be advanced in rank and pay. Get off to a good start now. Visit your nearest U. S. Army and U. S. Air Force Recruiting Station.**

U. S. AIR FORCE

RECRUITING U.S. ARMY U.S. AIR FORCE

F-94 to Alaska

(*Continued from page 40*)

factory," said Captain Barnes. "The 'Goony Bird' has all our spare tires and minor parts, but it doesn't have a new tail pipe."

The 'Goony Bird' is the Douglas C-47 that acts as a mother ship for these six jets. Each jet, with the exception of Captain Johnson's, had it's own crew chief in the back cockpit. These flying mechanics had attended school at Lockheed before returning with their new airplanes.

White the teletype circuit was humming with the request for parts, the flight mechanics removed the old tail-pipe and readied the F-94 for a quick change.

The juke box in the flight-line coffee shop at Edmonton had two selections popular in Alaska and Canada, but not yet on the hit parade in the States. Their titles—"When the Ice Worms Nest Again" and "The Squaws Along the Yukon Are Good Enough For Me." "Doc" Blanchard put in a nickel and played "Way Down Upon the Swanee River."

After the repairs were completed, our three planes took off from Edmonton with Captain Wisby on the right wing. We climbed to 25,000 feet, cruised on top over Whitecourt and Grand Prairie Radio. A scattered undercast changed slowly into solid clouds over St. John and we cruised along in the bright blue Canadian sky on top. Over Beatton River Radio, Captain Barnes called the Air Traffic Control for permission to make a penetration let-down into Fort Nelson where the current weather was reported as 9,000 feet with lower scattered clouds and 30-mile visibility.

The three ships bunched together like baby chickens burrowing under a mother hen and Captain Barnes called "Reduce to 85 per cent . . . dive flaps . . . now."

The F-94's shuddered slightly as the dive flaps took hold. Then the lead plane stuck its nose into the clouds and we started down. The let-down was smooth and uneventful and the three jets popped out below the overcast about four minutes before they reached the station.

Fort Nelson is a marginal airport along the route for those heavy jets. Since the F-94 wings are thin and the bulk of the fuselage is loaded with engine, radar equipment and the two-man crew, there isn't too much space to put the landing gear. Consequently, rather small, high-pressure tires are used. Average jet-airplane tire life is short—even on long runways where excessive braking is not necessary.

Our three planes circled under the overcast for about 10 minutes to burn out their remaining fuel, and we landed with less than 100 gallons aboard. No one ran off the end of the runway and the pilots wise-cracked between themselves as they taxied up to the line.

On our next hop I had a chance to see, first hand, why the F-94 is called an "all-weather fighter." Weather reported the forecast for Whitehorse as 8,000 feet with lower scattered clouds, so we fired up the planes and took off. On this leg of the flight, Captain Wisby was leading.

After take-off, we circled the rain-soaked airport and headed out on course, climbing up through 20,000 feet of solid overcast. Rain streaked back over the plexiglas canopy in pencil-thin lines and showed in horizontal streaks past the wing tips. You could see the paint disappear from the red leading edges as the three planes plowed upward through the wet weather.

Just as we broke out on top and loosened the formation, the Fort Nelson radio called, "Jet zero nine zero six, special weather report . . . Whitehorse has just dropped from 8,000 to 5,000 feet. The forecaster advises that you return to the base."

Captain Wisby called back immediately, "Will you get me the latest Northway weather (Northway was the next airport north of Whitehorse) . . . Let's go to 97 per cent and get some altitude . . ."

The higher the altitude, the more efficient are these jet engines.

Fort Nelson called again, within a minute. "Whitehorse is still 5,000 but deteriorating rapidly. The forecaster still advises that you return."

"Starting left turn and reduce power to 90 per cent," said Captain Wisby. "Nelson tower from jet zero nine zero six, what is your latest weather and advise GCA that we are returning . . ."

"The current Fort Nelson weather is 1600 feet overcast with lower broken clouds, light rain and five mile visibility . . . GCA is standing by . . ."

Tech. Sgt. Roland Cooper of Hamilton, Ohio, riding in the back seat of Captain Wisby's plane, put his head down and flexed his big hands. "I'm really going to sweat this one out," he told the pilot over the intercom.

From 25,000 feet on down, there was little to do but watch the two other planes bob around slightly in formation, and listen to the talk on the radio.

"Reading you loud and clear on GCA," said the ground station, "but you are not yet on the radar scope . . ."

"Did you know that you just passed Ft. Nelson?" asked Captain Johnson. The planes were in such close formation that the flight leader merely nodded. On an actual let-down of this type, the flight leader does all the navigation and makes the radio contacts.

"Do you have us in the scope yet?" asked Captain Wisby.

"Negative," was the reply. "You're still too high. What is your present position?"

"We're headed inbound to the station on the north leg of the range. Present altitude 13,000 feet," answered the flight leader.

"I've got a touch of vertigo," said my pilot over the intercom. "When you're flying instruments like this and watching the lead ship so closely, vertigo happens quite frequently. You can always tell when I'm having that sensation. I fly about six feet higher than normal in formation."

"We are now inbound descending to 11,000," said Captain Wisby. "Let's up the power to 90 per cent and it'll be easier to fly formation . . . now."

This was the real McCoy. Normally in the States, a let-down of this type is simulated for pilot practice, but not today. We were making a normal range let-down and the GCA crew was standing by to bring us in on a low approach. This is the pay-off for hundreds of hours of practice and thousands of dollars of expense, but it all saved a million dollars worth of airplanes and, incidentally, six guys who were in no particular hurry to meet their Maker.

"We are now five miles west of the station doing a turn around," said Captain Wisby.

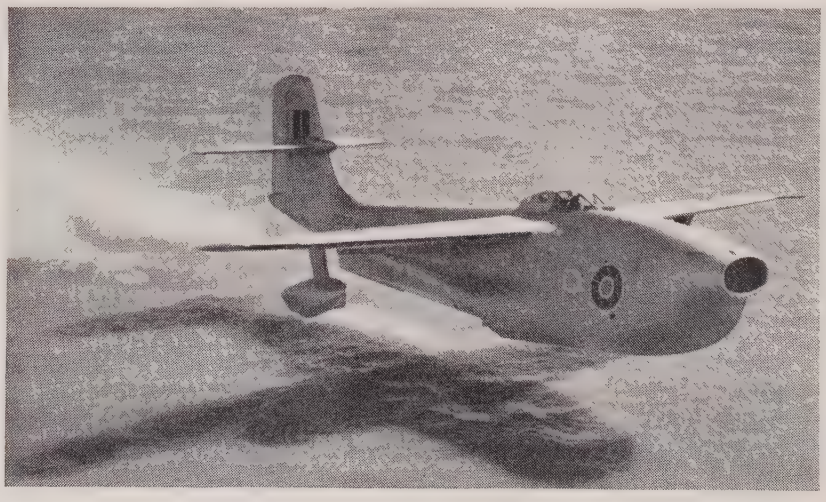
"We now have you in good radar contact," replied the GCA crew. "Turn right to 200° for positive identification."

On solid instruments, the only way I could tell that we were turning was to watch the peel-up of the wings and feel the "g" load.

"You are now 12 miles south of the station. Continue your turn to a heading of 200°. Descend to and maintain 3,000 feet," said the GCA operator. "Your current weather is 1600 feet overcast with lower broken clouds."

The sickly grey of the cloud interior changed briefly to gray-green and the tops of the pine trees flicked into sight intermittently as we sped through the bottom edges of the clouds. I was wearing an old physical education "sweat suit" under my flying overalls —and sweating.

Again the forests appeared and the three jets streaked in under the weather with a slot of over a thousand feet between the cloud



FLYING-BOAT FIGHTER—World's only water-based jet fighter, the Saunders-Roe SR-A1, is shown here taking off for a trial flight. SR-A1 is powered by two jet engines; is in "over 500-mph class"; two prototypes of SR-A1 crashed

base and the tree tops. It was just like flying through the crack under a swinging door.

"Let's go ahead and finish the GCA run for practice," said Captain Wisby. "Spread out . . . and drop your gear . . . now. Tell me when we're one mile from the glide path."

"This is your final controller," said the GCA transmitter. "Do not acknowledge any further transmission. You are now five miles from touchdown and coming up fast on the glide path . . . Turn to zero two five degrees and descend 700 feet per minute . . . You are now 3½ miles from touchdown . . ."

The changes in heading followed at one- or two-degree intervals and I leaned out to watch the other two planes on our right. Through the rounded curve of the canopy, I could see the runway looming up dead ahead. We were lined up perfectly.

"You are now over the end of the runway," said the operator in the GCA shack who could "see" us only on his landing scope.

"Good run," said Captain Wisby as the three ships sucked-up their wheels and pulled up 500 feet to burn out some fuel. With precision instrument pilots like these three, there's "no sweat" about going anywhere in the world—on instruments. It was surprising, at least to me, to find such a sharp GCA crew at such an isolated station.

There's none of the rah-rah Into-the-wild-blue-yonder about this group of fighter pilots. They're mature—all these three are over 30 years old. They all seem to look upon flying as a business.

"There isn't any room for the 'hot-rocks' in the ships we're flying," said Captain Wisby after our uneventful landing. "We're flying expensive equipment on a precision job. We don't take any chances."

"This one was routine," said Captain Barnes. "The roughest let-down I've ever made was the time I followed Col. William P. Benedict—our former Commanding Officer—into Kodiak in the rain with the ceiling down to 200 feet and a quarter of a mile visibility. We were flying F-80's and the Colonel had "Doc" Blanchard flying on his wing. When they broke out under the weather all lined up for an easy landing, the Colonel said, 'Wheels up. Let's go around and do it again. This is good practice.' That's how we learned to fly instruments in a fighter."

"The important part about a jet let-down," explained Captain Wisby, "lies in being able to 'track' properly into the station. We have some wild winds up in Alaska that frequently go over 200 mph. If you just 'bird dog' (follow the needle of your radio compass) on the station, you can easily plow into a mountain. We teach all the new pilots who come up here from the States how to track into the station on a given heading in the T-33 before we check them out in any of the single-seat planes.

"When there are a lot of electrical disturbances in the sky, we have to track into the station using our radio compass in the 'null' position—flying toward the no-sound spot in front of the antenna.

"One of the older pilots who just joined our squadron after being out of flying for a few years told me that he was just now really beginning to learn to fly. He said that the fighters he flew in the last war didn't require any of the precision flying we're doing here."

Since the weather showed no sign of improving, we had the planes refueled and spent the night at Fort Nelson.

After our let-down into Fort Nelson, the hop on to Whitehorse was comparatively uneventful. We took off the next morning, climbed back on top and cruised for an hour into ever-improving weather. Below, snow was visible and ice remained in some of the rivers and lakes.

Over Whitehorse, the three jets had more fuel aboard than was comfortable for a landing. A 'hot rock' fighter pilot would have done acrobatics, but not these older-but-not-bolder pilots. They practiced an instrument let-down in formation, just in case they ever had to go into Whitehorse in dirty weather.

While the planes were being refueled, we had a chance to go downtown and look at the fabulous river boats of the Yukon. These huge sternwheelers draw only four feet of water and navigate the river down to Skagway. The boats are pulled out of the water during the winter and were just going back into commission. Downstream it's two days and five days back up again. The woodburning engines take a log a minute on the upstream trip. Our F-94's could cruise the same distance in about 12 minutes.

The last leg "home" for the pilots was by far the most awe inspiring of the whole trip. We flew up the airways over the radio range stations with the picturesque names of Aishihik, Snag and Northway. Snag in Canada is reportedly a colder spot than all Alaska during the winter months. The country below was completely isolated and even single cabins were marked on the airways maps.

From Northway we crossed the Alaskan range and began to head for the coast. "Up ahead are the glaciers," said Captain Johnson. We had a break in the weather and only scattered clouds covered these white mountain peaks. The broken pattern of the cravesses is beautiful to view from the air, but it would be more than a minor problem were you on the ground.

"I'll bet there isn't a living soul within 50 miles of us," said Captain Johnson over the intercom. He emphasized "living" just slightly.

The whole area looked like the last reel from "Lost Horizons," multiplied about six times and projected on a giant blue-white screen.

"If we had a 'flame out' (engine failure due to fuel starvation) here, I'd be tempted to try the trick that I heard about recently. A pilot in an F-80 had his powerplant fail and his wing man flew in behind him, jammed the nose of his fighter into the dead tail pipe and pushed the fighter back to his base."

We streaked by Mt. Marcus Baker and down over the Matanuska Glacier and into the fertile Matanuska Valley, scene of a mass migration movement of the depression era. From a very quick glance, the area looks prosperous.

Around the corner of Knik Arm and there's Anchorage.

We pulled in, circled the busy airport and landed. Another red-and-silver fighter, fresh from the factories of Southern California, now sits on the alert ramp here at Anchorage. And the way they travel, it isn't so far from home.

TWA
Save on air travel with
TWA
Family Half-Fare Plan
You pay one full plane fare — only one-half fare for each other family member. (Husband or wife, children over 2 and under 22.) On Mon., Tues., Wed., in the U. S.
See your travel agent or call Trans World Airlines
Across the U.S. and overseas... you can depend on TWA

Taming the Mustang

(*Continued from page 19*)

United Nations ground troops.

On the ground, Allied infantry was fighting overwhelming numbers of the enemy. True, they were killing five North Koreans for every UN marine or soldier lost. Nevertheless, our side was steadily falling back.

Many more *Mustangs* were on the way from the United States, of course. Hadn't the aircraft carrier *USS Boxer,* her flight and hangar decks jammed with F-51's, just docked at Tokyo? And wasn't it a fact that American pilots and ground crewmen to fly and maintain the *Mustangs* were arriving in rapidly increasing numbers? All that was true, of course.

It was an added blessing that these airmen were in great part completely familiar with the war-proven '51's. Consequently, the under-strength fighter outfits already in action in Korea were snapping up the veterans as rapidly as they debarked from the transport vessels and planes.

But the ROKAF, engaged in a life-and-death struggle and woefully under-trained, needed instruction on the *Mustangs:* instruction of all kinds, for they had no veteran pilots or maintenance men upon whom they could rely.

It was for that reason the tiny unit from Chanute had been shipped out to Korea. Its mission was to swiftly provide training so vitally needed to bring the ROKAF pilots' proficiency to a point somewhere near that exhibited by their Allied counterparts.

With the urgency of the situation clearly in mind, General Kim must have experienced some misgivings as he watched the detachment and its equipment unloaded from the cargo-planes landing at Chinhae. So few men, such a seemingly meagre amount of equipment! How could they possibly hope to bolster his training program? So must have thought General Kim. He had men scattered from Pusan to Taegu. How were so many to learn from so few?

But his sagging spirits must have begun to lift as he inspected the stenciling on the various crates: "F-51 Fuel System" . . . The list was long—and complete. He began to question Lt. Denomy.

General Kim was told that each unit member was assigned to teach a specific system of the F-51. Each system was portrayed by a mock-up, mounted on lightweight boards and equipped with wheels, thus making the entire display easily movable. These training aids, Denomy explained, could be packed swiftly into their special crates, loaded aboard planes and flown to any spot where their use was required.

Now the General smiled. He had reason to be happy, for there was before him a splendidly trained, highly mobile organization representative of the best in Air Force instructional media. Although it comprised only nine men and a few thousand pounds of equipment, its combined skill and compactness made it the consolidated equivalent of many separate schools.

After the General had departed with his group, the members of the detachment applied themselves to the eternal problem of a mobile unit: where to live and set up shop. At times, living and teaching quarters are fine. But, at Chinhae . . .

Denomy and his eight instructors spent that first night—and succeeding nights—in the Chinhae headquarters building. They may have derived some small comfort from the fact that they were billeted in the "head shed," even though the building was notably lacking doors, windows and most of the roof.

The devotion a detachment has to its mission is evident in the fact that the equipment was housed in the one building in the area which had a roof intact. Reminiscent of the old cavalry slogan, "See that your horses are watered and fed before bedding yourself . . ."

Three days after the detachment arrived at Chinhae, 143 South Korean Air Cadets, ROKAF pilots and ground crewmen began school. Also on hand was a very proud General Kim, accompanied by an ROK admiral. The General waxed eloquent in explaining "his detachment" to the Navy.

The ROKAF personnel were to be given a specialized course in the F-51, while the cadets would receive basic instruction in the operation, maintenance and general layout of the fighter.

A few of the cadets would later go to Randolph Air Force Base in Texas for flight training. They asked to be briefed in what to expect at the United States base. So, a class in USAF history and organization, together with familiarization in USAF Air Cadet training program was set up to supplement the aircraft study. Lt. Denomy, a former pilot instructor, undertook the extra-curricular burden. This, on top of his demanding duties as CO of a busy detachment.

Quickly demonstrating themselves as willing workers and diligent students, the South Koreans rapidly gained the respect and liking of their American teachers. Any instructor appreciates a student who soaks up information like a blotter. "They'd practically crawl down your throat while listening to you," one instructor gleefully explained.

As with any unit "on the trail," there were problems. In this case, they were unique.

The language barrier was the first obstacle to be surmounted. Admittedly, the detachment couldn't solve that one alone. So, they asked the ROKAF to assign interpreters. The ROKAF had anticipated that, and had already named an interpreter team. Once the "switch-talk" boys caught onto the technical terms and phraseology, the language problem rapidly disappeared.

Next, there arose the poser as to how it would be possible to prepare an F-51 training manual written in Korean. This project was the detachment's own idea, as the men figured a pamphlet written in Korean and explaining each system of the plane would give the eager students something definite to us as a reference while studying.

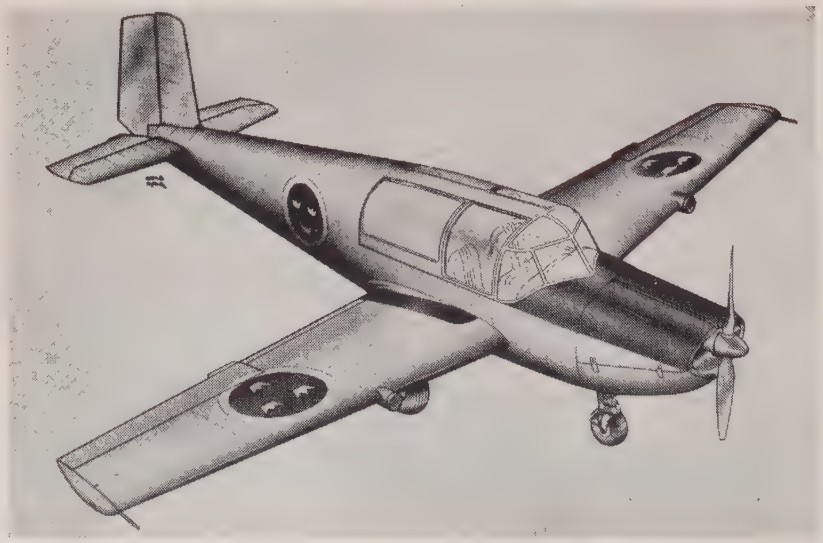
Work on the manuals sped ahead, each American contributing every bit of knowledge he possessed on his particular phase of the training to the Korean interpreter-editor. Then, everything came to a screeching halt. The unit was alerted for movement to Kimpo Airfield, just north of Seoul, the South Korean capital.

The area had just been cleared of Communists and "The Kimpper" had been booked to become a corral for *Mustangs.*.

Things were in what could well be called a "super tizzy." Working swiftly but methodically, the unit graduated the class of ROKAF pilots and crew chiefs, but it was impossible to get the cadets through. This latter tangle resolved itself, however, when it was learned that the cadets would accompany the detachment to Kimpo, there to complete the training. When this news was passed to the cadets, a shout went up, for Seoul was home to the majority of them and they hadn't been there in some time.

The night the news was received, the Americans were given two parties by their grateful students. Exact details of the affair were not recorded, nor even clearly remembered. What few fragments were available indicated the blow-out was a complete success. "Food, food and likker and more likker," one man recalled (vaguely). Another, "Never heard so damn many speeches in my life—and understood so few."

As the first news was amplified with each succeeding report, the picture for the future seemed to improve. A school building had been set aside for the detachment. Trans-



SWEDISH AIR FORCE has ordered large number of Sk-50's, military trainer version of all-metal three-seater *Safir.* It is powered by 190-hp Lycoming

portation by sea had been procured for the trip from Pusan to Inchon. As a glorious topper came word that the detachment would return to the United States after the cadets had been graduated.

While the whole unit was elated at news of the return Stateside, Cpl. Stanley Keegan out-elated the rest. Seems he'd been married just one all-too-short week before shipping to Korea.

Shortly after receipt of the news of transportation by sea, Lt. Denomy traveled to Pusan to check the plans. He was informed that travel would be aboard an LST. In search of the vessel, Denomy twice traversed the long line of ships nosed into the stringpiece along the harbor. On each trip he noticed with distaste a filthy, rust-stained LST which leaned like a drunken old bawd among the comparatively clean ships about her. "This," muttered Denomy, "can't be our home from home for the next four days." But, it was. No doubt about it, that disreputable sister to a garbage scow was the transportation to Inchon.

Dejected but determined, Denomy returned to Chinhae and gave the glad tidings to his men.

"Not only is she dirty, she has an odor that exceeds all imagining, a stench about her that is warping the paint off ships on either side," reported Denomy to his unit. "But, the accursed ark was already loaded, so I requested we be placed on the loading list for the next trip. Maybe," he added hopefully, "she'll smell better when she returns from Inchon."

But, when the "Stinker" (as she had come to be known) came back to Pusan, she was malodorous to an even greater degree. Notwithstanding, the unit went aboard. To add to the joys of the junket were some 2,000 other passengers, none of whom had ever heard about those "13 danger spots." The next four days were about the most uncomfortable ever spent by a Mobile Training Detachment anywhere, ever.

The men of the unit fell so deeply in love with the old bucket and were so loath to leave her that they labored all through the night following their arrival at Inchon. No equipment was unloaded more swiftly, nor eagerly. With everything ashore, the detachment high-tailed for Kimpo.

Arrival at the new base was marked chiefly by the discovery that the unit was now 10 in number, instead of the original nine. Seems they hadn't been able to leave the 12-year old cabin boy, name of Kong U Suk, back aboard that stink steamer. With that rare American facility for translation applied, Kong U Suk immediately became known by the handy name of "George."

The housing problem at Kimpo was virtually non-existent, principally because housing was also non-existent. Still, the unit made out rather well, living in tents. Once more, the equipment came first. It was housed in the Yongdongpo Midde School building, a comparatively whole structure which kept the displays dry if not comfortable. This was considered to be of no great inconvenience, even though the men—and George—had to walk a mile each way from class to billets.

Tragedy struck the "caravan college" and its students soon after the detachment was set up at Kimpo. The Korean cadets were given a short leave to visit Seoul in an attempt to find their families. When they returned, most of them brought back the knowledge that their families had died at the hands of the Communists.

ANTI-SPLASH FINS to keep water from flying back into seaplane's propeller and pitting it were designed by Joseph Schwartz, head of Brooklyn, N. Y. Skyport. Fins are fitted to front inside section of each float, and help to keep salt water from damaging engine and windshield. Fins also permit quicker take-offs by reducing drag usually caused by splash-back of water

"After that episode," Lt. Denomy relates, "the Korean cadets listened so hard that if we made one statement which didn't exactly coincide with the manuals—we'd finally had them printed—the Koreans looked at us as though we personally had ruined Seoul."

When the final grades were totaled up immediately after the last class, it was found that every man had passed. The instructors, however, were dissatisfied with some of the lower grades. They blamed the decreased standings jointly on the move from Chinhae to Kimpo and the shock resulting from the disclosure of the Seoul horror.

By inaugurating a 10-day refresher course, low students were put through. The scheme was so effective that every one of the repeaters finished with high grades and was promptly assigned to join those who had graduated earlier and were now putting their training to deadly use against the Reds.

During all this, George, the mascot, had been generally useful. He made bunks, shined shoes and collected local rumors. He cadged cigarettes from the men of the detachment. He grew so fond of his "fathers" that he even reached the point where he would stand still to have his ears washed or to receive a blistering lecture on the subject, "Why You Shouldn't Cop Candy from the Instructors." Altogether, the unit and George comprised a mutual friendship society.

Suddenly, George was going to leave. Came one day an order from Fifth Air Force Headquarters in Tokyo, directing that all Korean orphans living with United States troops be sent to the nearest orphanage.

So George, wearing his four rows of ribbons, his lieutenant's bars and tech sergeant's stripes, departed for an orphanage in Seoul. George smiled as he waved goodbye, but the "Dads" didn't.

The boys were pretty glum until the next morning, when they rose to find the small, bright-eyed lad standing outside their tent. He had gone over the wall at the orphanage and, traveling all night, walked back to his "parents."

His stay with the unit was brief, for the orders had come through directing the detachment's return to Japan as first leg of their return home. What to do with George? He wouldn't stay in the orphanage, that was for sure. And they didn't like the idea of the kid running wild in battle-blasted Korea. The problem was solved by the Korean airmen.

"We would," asserted ROKAF General Kim, "consider it a privilege and a pleasure to take care of George. It is the least we can do."

With that matter disposed of, the detachment smiled, took up the slack and began the business of getting ready for the trip back Stateside, the return to home base at Chanute, where they would receive new assignments.

Some of the men would be sent to factory schools to receive refresher courses. Others would take transition training to jets and electronics, instruction which would fit them to become instructors in the hush-hush Guided Missile Mobile Training Detachment, which is still in the planning stage.

Others would join detachments headed overseas to Italy, Belgium, France, England or anywhere else in the world where Air Force units or air force units of the members of Mutual Assistance Defense Pact needed training.

Wherever they may be, members of F-51-4 can smile with pride over the announcement that at press time two more Mobile Training Detachments were in Korea, their presence being the result of the fine showing made by "Denomy's Demons," the pioneer Mobile Training Detachment in the current Far Eastern conflict.

EXEC 'COPTER—Port of New York Authority's "executive car," a 'copter to be used to transport Authority's executives on visits to airports, bridges and tunnels in metropolitan area, began routine service recently. Base of operation is heliport atop Port Authority building. First 'copter travelers were A. J. Tobin, Director; D. V. Lowe, Port Commissioner. Pilot is Ted Leopold

Pattern for Business

(*Continued from page 15*)

cerned, they are excellent on shorter hops. Some executives simply prefer two engines to one—and so the DC-3, *Lodestar* or the Twin Beech are the top choices.

Of course, some companies have bought other makes of planes to solve special problems. The Texas Company, besides its three executive DC-3's, has two G-73 *Mallards* and one G-44A *Widgeon* in Houston and New Orleans for water landings. Texaco also keeps four PBY's in Colombia and Venezuela for bush flying. And it has a Twin Beech, four Spartans, and five *Navions* for its aviation representatives in the domestic sales department.

Although most companies haven't bought 20 or more planes the way Texaco, General Motors and one or two other corporations have, the first cost of executive aircraft is still a substantial item. For example, a brand new Twin Beech without radios and instruments runs close to $70,000—a surplus Beech can be picked up for $18,000 to $25,000. And a surplus DC-3 starts at around $80,000 with plush conversions pushing the outlay up to $140,000.

But the smart companies know such an investment is a wise one. First, they have made a sound investment, materially speaking, because the cost of aircraft is going up. Second, flying private planes insures executives against getting "bumped" if the airlines ever have to cut back again. Third, business men know that the best way to sell a man is to shake his hand and look him in the eye. And the fastest and safest way to get to the customer is by plane.

Satisfied presidents of corporations are suggesting more and more to their friends that "You ought to get a plane. Good investment. It's fast—nonstop to the midwest. It's safe—radio's done that. It's comfortable—you ought to see the inside of mine—oak-panelling, thick rugs, luxury beds. And a built-in bar."

Many companies that have taken the corporate aircraft plunge within the past few years are already on their second round of buying. Cornell-Dubilier of South Plainfield, N. J., for example, has just bought a new DC-3 to supplement its Twin Beech; and Texaco has recently stepped up into the Convair 340 class.

The point is that as private companies swing to the fleet concept they get increased value in geometric proportion. For one thing, more and more executives get value out of the planes. At Cluett-Peabody, for instance, the older Beech has shown a steady increase in the number of hours flown since the company bought its *Lodestar* in August, 1950.

We might make an interesting aside here to the effect that using the company plane has led more executives to use the airlines when their own plane is out.

Most companies keep their planes in the air around 500 hours per year. For example, Allied Stores, with a Twin Beech in Seattle and a DC-3 at Westchester County Airport in New York, puts about 400 hours per year on each of its planes; while Cluett-Peabody may put as many as 700 hours per year on its *Lodestar*. Putting on more than 700 hours, however, usually means hiring another crew.

So, the idea of corporation ownership has been tried and found not wanting. But what does it entail? If you buy a surplus DC-3, where can you get those bucket seats ripped out? How many pilots do you need? Where do you keep the plane? And what about satisfying the CAA that the plane's in good shape?

Again, those who have bought and owned planes and then gone out to buy more can answer the questions.

You can buy new planes—a Twin Beech or DeHavilland *Dove*—from dealers all over the country. New Convairs and Martins are available, too. Surplus C-47's and C-54's can be bought all over the world.

And it's easy enough to get surplus planes converted by companies that have been established for just that purpose—such companies for example, as Lodwick, Mallard, Spartan Aero, Grand Central Aircraft, Remmert Werner, or AiResearch. The owner can satisfy his personal taste, but the trend is toward refined decor with the "Brooks Brothers" touch.

Conversion usually includes lowering the floor, installing new baggage and passenger doors, laying good carpeting, building in beds, reclining chairs and tables to suit the owner, and putting in food warmers and liquid coolers. Most companies have discovered that it's easiest to limit the size of the galley and pick up food as needed at the many airline caterers.

Conversion, too, has begun to shake down into a smooth pattern as more and more corporations buy aircraft. Executives are already choosing fabrics to please their wives. And there is at least one story of a wife who asked whether she personally might add a "homey" touch by covering the plane's pillows with some of the expensive fabric that had been bought for the ship's interior. And "homey" it was—she bungled and crept back to the upholsterer for more material, hoping he could give it to her without going "through channels."

But once an executive buys a plane and has it redecorated, who's going to fly it?

Pilots, the most important men in the set-up, are available at the moment. The pilot is important because he always makes the final decision on whether a plane shall take off or not, weather being the consideration. He also oversees maintenance. He's the crew chief both on the ground and in the air.

Selecting a pilot is of critical importance. Texaco, having flown its own aircraft since 1928, has laid down some stringent pilot requirements. As Capt. William Baldwin, chief pilot for Texaco, put it, "We require a minimum of 750 hours in the air, a commercial pilot's rating, an instrument rating and one year as an airline co-pilot. I personally flight-check all applicants, then ride for several hours as co-pilot on those we accept." New pilots at Texaco are on probation for five months.

Training never stops. Texaco's minimum monthly requirements include at least three hours on instruments, three low approaches and three night landings. Capt. Baldwin flight checks all pilots every six months.

Company pilots and co-pilots, for the most part, are on call 24 hours a day, seven days a week. They don't like the paper work they have to do, but they do it and there's plenty of it; for, except in a few companies where there's an office manager at the airport, pilots have to keep up their own logs as well as those on each airframe, and keep the card files on all accessories, engines and instruments.

Most companies hire a pilot and a co-pilot for each plane, with the co-pilot a license A&E to handle all maintenance.

Maintenance is a big item and a crucial one, and as more companies buy planes, the trend will probably be toward hiring two full-time pilots and letting a service organization handle all maintenance.

For one thing, there's a psychological problem involved. No co-pilot who is fully checked out in an airplane and who does most of the routine flying anyway wants to grub around the hangar pulling 25, 50 and 100-hour checks while the pilot, who gets a higher salary, is idly waiting until a call comes in.

For another thing, hangar owners are starting to insist that they handle all maintenance on planes permanently hangared with them. Hangar space being at a premium, hangar owners are in a position to make this demand. Bob Scarsdale of Atlantic Aviation in Teterboro, N. J., says that Atlantic will do all maintenance for any new companies hangaring planes there. Atlantic will charge a flat rate on all inspections, accessory and engine installations. Repairs will be charged for on a time and material basis.

Scarsdale's point is that it's going to be costly to hire a co-pilot-mechanic, then rent or buy the jacks, hoists, and prop tools necessary to good maintenance. His reasoning is why not turn over all the worry and responsibility of maintenance and overhauls to a good service organization?

For the present, however, many companies do hire a pilot, a co-pilot-mechanic, and sometimes a mechanic for each plane. Although CAA inspects every plane only once a year for relicensing, the aim of most companies is preventive maintenance. For example, Cluett-Peabody keeps its two pilots, two co-pilot-mechanics, and two mechanics working constantly on its two planes. When it comes time for a 100-hour check, a one- or two-day proposition, Bill DiPalma, office manager at the airport, fits the check into the schedule so planes are never "down" when needed.

Texaco runs all checks before they are actually due, utilizing its one mechanic per plane and its own stockroom and shop at Teterboro. For instance, Texaco's 1830's are always checked at 800 hours and radios come out every three months for a check whether they need it or not.

Although many companies at present do all their own maintenance and make any repairs necessary—rebushing landing gear, replacing slide tubes, etc.—when it comes to prop repairs, the general practice is to send the prop back to the factory. And for engine overhauls, almost all corporations use one of the big overhaul companies, such as Airwork in Millville, N. J., or Spartan in Tulsa, Oklahoma.

Under the maintenance category come daily inspections which usually include 35 to 40 items like "props and boots," "collector ring and tail pipe," "parking brakes," "flight kit and supplies," "cabin clean and neat," "wing covering and rivets," "fuel and oil caps," "electrical and radio circuit breakers," and "antennas." Inspections after 100 hours of operation include all daily inspection items and well over 100 more, going down to such detail as checking spark plugs, shielding, and cylinder hold-down nuts.

With maintenance such a big item and so vital to the safety and economy of operation, Texaco has broken down its over-all costs for study and come up with the following divisions: repair costs for radio and electronic instruments, accessories, and engines, with other maintenance costs falling into fixed and variable categories. Fixed costs include depreciation, salaries, insurance, taxes, upkeep of hangar and shop. Variable costs cover pilot travel, passenger service, landing at non-base airports, and gas and oil.

Insurance is a must. Most commonly bought are hull, property damage, and public liability, with companies occasionally insuring small craft like *Navions* for $100,000 and larger ones like DC-3's for $500,000.

Just as there are two views on maintenance —"Should I hire two fulltime pilots or a pilot and a co-pilot-mechanic?"—there are two views on scheduling.

Some system of scheduling, too, is a must, for aircraft cannot be put into the air on a moment's notice, and planes that are out on a trip for two weeks or more don't always return on the day specified.

Some companies with two or three aircraft for a dozen executives believe in writing a strict schedule with all scheduling in the hands of a Vice President. Executives must ask for the plane a week in advance. Then the schedule-maker tries to coordinate trips going in one direction, and types out a passenger list with the names of all passengers, time of take-off from home base and ETA at first destination. Since everyone must adhere strictly to this schedule, every passenger in a sense shares the responsibility for satisfactory operation.

Most executives realize they can't get airborne on a few minute's notice. Pilots have to check the weather, winds aloft, figure best altitude and best airspeed, and the plane has to be pulled from the hangar and warmed up. But still, when Chairman-of-the-Board Puckett of Allied Stores wants to take off on Friday night to visit three of his midwest stores before landing again in New York for a full day's work on Monday morning, he always knows he can do it.

As far as notification is concerned, some schedule-makers know as much as a month in advance when the planes are taking off. The average notice, however, is a week, but occasionally a *Bonanza* has cleared from New York for Washington or Cleveland on less than two hours notice from a busy executive.

By coordinating trips to most-traveled-to cities, several companies have found they can average two passengers per hop in their Beechcraft and four passengers per hop in their *Lodestars* or DC-3's.

Special equipment for company planes can include such items as plane-to-ground telephones, but they're not necessary, even for tight scheduling. Most pilots think that the plane-to-ground phones are an interesting "extra" for the executive rather than a necessity.

Some companies have gone to the wise expense of making all instrument panels of their DC-3's identical . . . or at least so similar that a pilot can shift from one plane to another with a minimum of difficulty. Basically, the gages in a company plane are there because the company pilot wants them, and he has won executive approval for having them. The company plane is, indeed, one of the best-equipped on the airways today. In many cases, these ships are better equipped than some scheduled airliners—and the company pilots are using those instruments to add to flight safety.

So, in both flight operation and maintenance of aircraft, company ownership has begun to shake down into a pattern—a safe and sound pattern that reflects the economic wisdom and insight of Amercian industry and promotes general aviation.

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Pilot Report . . .

(*Continued from page 22*)

to retrack backwards into the engine nacelles. Wheels and disk brakes are Goodyear and the generous 12-foot 4-inch wheel spread makes the *Commander* a cinch to handle on the ground.

"You climb into the left seat and do anything you want with the airplane," said Bert Bantle as he stepped into the cabin. "Once we're in the air I'll show you the unusual control this airplane has in a stall and slow flight, but feel free to do whatever you want with the plane."

Visibility from the pilot's seat is wonderful —after you get used to the idea of sitting so close to the ground. The pilot's eye level is only five feet above the runway and at first you feel as though you were dragging the seat of your pants along the runway.

The simplified fuel system is proof that this airplane has been designed with the inexperienced pilot in mind. While throttles, propeller controls and engine accessory instruments are in pairs, the *Commander* is not a complicated airplane either to start, taxi or fly.

Electric fuel-boost pumps are used to prime the engines by pumping the throttles a couple of times when the powerplants are cold. Once they have been run and warmed up, no priming is necessary. Just snap on the mags, hit the starter button and your engine is turning over. At first, the sight of that propeller turning close to the cockpit and just behind your left ear is a little disconcerting, but you soon forget all about it.

As in any transport airplane, the blind-flight instruments are located in front of the pilot and the engine instruments on the right-hand side of the panel. The cockpit is not so large that it would be difficult to read all the engine instruments from the pilot's seat. Radio navigational equipment will be installed in the center of the panel. A full set of gyro instruments, constant-speed full-feathering propellers, Lear VHF and Lear ADF will be installed on the production model as standard equipment.

Taxiing is very easy. You can steer the airplane either with the brakes or the throttles—or both. There is very little lag between the time you apply one throttle and the airplane turns. The nose wheel will swing through a 30° arc.

The average aircraft engine should not be idled below 600 or 800 rpm, but not these geared Lycomings. "Just come all the way back on the throttles," said the company pilot. "They won't quit or load up."

With the throttles pulled back to the stops, the propellers turned so slowly that you could count the blades passing by. These engines sound just like a smooth automobile engine at slow speeds.

Many an aircraft will heat up when taxiing downwind, but the head temperature gages were well down in the green even though we had to taxi downwind for a half a mile with a 20-mph wind pushing us along. No cowl flaps are used on the prototype, nor are any planned for the modified cowling of the production model.

At the end of the field, we headed into the wind for run-up, even though the factory pilot said that it wasn't necessary. The pre-flight check is surprisingly simple for a transport airplane. The propellers are checked at 1500 rpm. Then one engine at a time is run up for a magneto and power check. Usually the engine that is started first is run-up first since it has had more time to warm up. However, with these flat six-cylinder engines, you're usually warm enough for take-off by the time you reach the end of the runway.

The fuel boost pumps go on, and the hydraulically operated flaps go down to the half-way point for the most efficient take-off. A check of trim-tab and control freedom and you're ready to go.

Any tricycle gear is wonderful on take-off, and the *Commander* is no exception. In "old fashioned" twin-engined airplanes, the pilot had to lead with his left throttle to keep the torque from pulling him off the left side of the runway. With the *Commander*, both throttles go forward together and you "drive" down the runway.

Acceleration is rapid. There's no doubt that you're sitting behind 520 hp. The airplane will take-off with a full load in 600 feet, but on this first flight, we let it roll out slowly and fly itself off the ground.

With light back pressure on the control column, the load comes off the nose wheel and then, all at once, the nose comes up about 10° and you're in the air. The airspeed read an even 70 as we left the ground.

The landing-gear handle, shaped like a wheel, has two distinct motions to unlock so that there is no chance of accidentally pulling the gear out from under the airplane.

"In 625 hours of test and demonstration flying, no one has yet landed gear up or pulled the gear out from under the airplane on the ground," commented the pilot. "However, if anyone should pull that prize boner, there would be very little damage because with the belly setting on the ground the propellers would still clear by 16 inches."

There is no tendency for the *Commander* to settle as the flaps come up. A small re-adjustment on the trim-tab immediately eliminates the nose-heavy control touch.

"Your most efficient rate of climb is at 110 mph," said Mr. Bantle as we pulled up into the cloud-studded Oklahoma sky.

I glanced down at the airspeed. It already said 130. Up came the nose . . . and then up some more. When the airspeed indicator finally settled down on 110 mph, it felt as though we were lying on our backs and going straight up. The angle of climb was extremely steep and the rate indicator showed 1700 fpm.

"What's the first power reduction?"

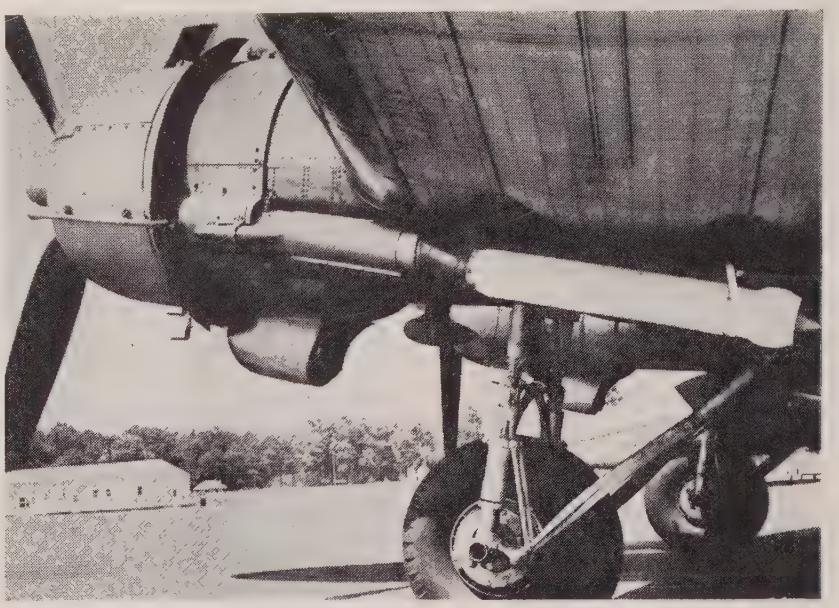
"None," replied the pilot. "The Lycoming people recommend a full-throttle climb because there's an automatic enrichening jet in the carburetor that keeps the cylinder heads cool with the throttle wide open. But you can come back on your props to 3,000 rpm."

We climbed up to the 5,000-foot cloud base in less than four minutes and leveled off. The airplane is fast. With 23 inches of manifold pressure and 2700 engine rpm, the plane indicated 173 mph at this altitude. Factory records show a fuel consumption of under 25 gallons per hour at this power setting.

The rpm settings on this airplane are rated for the crankshaft speed of the engine, not the speed of the propeller. There is a 77 to 120 gear reduction between the engine and the propeller so that your propellers are only turning 1925 rpm when the engine is turning 3,000.

One of the most surprising flight characteristics of this plane is its extremely rapid rate of roll. When you crank in a little aileron, that wing goes down right now. The control touch is very light and smooth but not at all "touchy." Any pilot new to the airplane tends to make his first few turns with too much rudder, thus skidding the bank-and-turn ball up to the high side of his turn, but that is easy for a new-to-the-plane pilot to correct.

Slow flight and stalls show up the high caliber of design experience that went into



MUFFLER, shown here installed on a C-47, reduces take-off noise by some 60 per cent. Developed by Aero Sonic Corp., the muffler has been service tested for some time and has been given preliminary approval by the CAA

airplane. Thirty-two thousand man hours engineering went into this plane. Another 000 hours went into preliminary tooling le 25,000 hours more were spent in the al fabrication of the first airplane.

It cost a quarter of a million dollars to this first airplane in the sky," said the igner Ted Smith.

For a check of the slow-flight handling, cut the power and gingerly slowed the plane down to about 70 mph. It went right flying! At an indicated 65 mph, the ship still flying easily with the nose way up the air. The airspeed was under 60 mph re the stall developed. Then the airplane feted mildly and the nose started to drop he wings remained level.

Let me have it for a minute and I'll give a real quick demonstration of the dling characteristics," said Mr. Bantle.

He pulled the nose up at what seemed to a 45° angle and just sat there. When the p stalled, he held the wheel all the way k—just the same way you would do a der-exercise-stall in a little tandem trainer. ship shuddered and the nose oscillated wly down toward the horizon and then k up again.

See, you still have aileron control."

He rolled the wheel and a wing dropped. rolled it back and the wing came right k up. I perspired freely, remembering ne of the older airplanes that caused pre- flight instructors to say, "You pick up wing with the rudder in a stall. If you aileron, you're liable to make it worse."

Rudder control too," commented the tory pilot as he skidded the nose off to side while we hung at an impossible le.

It's the same with the gear and flaps n," he said and hit the gear switch.

Extreme stalls were completely docile and airspeed was down to 56 mph before airplane paid off.

Remember how they used to teach the gers of turning into the 'dead' engine?" d Mr. Bantle.

He cut one engine clear off and let it windmill. Then he tossed the little *Commander* into the steepest vertical turn that I've ever ridden through—with that windmilling engine toward the ground. It was exactly like the first quarter of a slow-roll. Our roll out of this vertical was instantaneous as soon as top aileron was applied. If the Aero *Commander* was ever going to fall out of a turn, that vertical would have been the one.

"Don't worry about babying this airplane. You can throw it around without hurting anything," said the pilot. "The red-line speed is 270 mph, 10 per cent below the designed diving speed. The structure will withstand a 30-foot-per-second gust at an indicated 200 mph in level flight, so you don't have to worry about pulling anything loose."

Since much of the emphasis of the Aero *Commander* is placed on safe single-engine performance at the usual "critical" speeds so common in transport aircraft, I pulled the plane up in a partial stall with the gear and flaps down. The throttles were set at 18 inches of manifold pressure and the props forward to 3,000 rpm, simulating a slow power-on final approach. Then the nose came back and the airspeed dropped to 58 mph—that's just two miles above the stall. The ship was hanging on the propellers and mushing through the air without any difficulty.

"This is 'dirty pool,'" I told Mr. Bantle, "but I want to see what will happen."

"Go right ahead," said the factory pilot. "The ship won't throw you a curve no matter what you want to try."

I reached up and snapped the right throttle closed. Just a slight amount of right rudder pressure held the nose straight. The ship didn't stall out or fall off on a wing. The rate of descent picked up slightly, and we continued to mush down under complete control.

The power came back on slowly. Up gear and flaps and we were back at cruising speed.

The only flight characteristic that is anything out of the ordinary is the slightly restricted visibility behind the plane on each side. When you look out and back in the *Commander*, you see the engine nacelle, but after a couple of turns, you will find it relatively easy to pick up the wing with a little aileron. Look under the nacelle and then go ahead and make your turn. Actually, it presents no problem and the unexcelled forward and downward visibility, plus the high-winged advantages of backseat-passenger visibility, more than make up for picking up a wing before starting a turn in congested traffic.

"How about a couple of landings?" asked Mr. Bantle. "Why not go into the Wiley Post Airport first? That's a sod strip and you can see how it handles on the grass. Then we can go into the paved Downtown Airport."

The high red-line speed is a fine asset on let-downs. If the air isn't too rough, you just push the nose down and go chasing along behind it. Of course, the visibility is tops.

The Wiley Post Airport is a grassy square with white boundary markers indicating the runway area. A small yellow tetrahedron gave the wind direction as we circled over the airport.

Turning in on the downwind leg, I slowed the *Commander* up to 120 mph and dropped the gear. The green light came on, the horn didn't blow when the throttles were retarded and Bert Bantle said, "I've got a wheel on my side."

There's no question of the gear being up or down on this airplane. You merely look back over your shoulder and there it is.

We maintained 110 mph through the turn off the base leg and rolled out on the final approach before dropping the flaps. The hydraulically operated flaps come down in 3.8 seconds and require a slight re-trim to take the forward pressure off the control wheel.

"Try and hold an even hundred miles an hour across the fence on your first landing in this gusty air. Then when you get the feel of the airplane there's no problem to bringing it in at 80 or even slower."

The ship was stable as a rock on the approach. If you're a little low, just ease in a little power, or if your pattern is too high, the big flaps permit a steep glide to the end of the field.

As we came across the fence, the throttles came back and we began to hold the airplane off the ground. As is so common in a strange airplane, we came back a little too fast on the wheel and the little twin-engined job started to go back up again. Just a touch of throttle eased her back down and the wide gear began to bump along over the uneven runway.

"Nearly everyone does that at first," laughed the factory pilot. "You're not accustomed to sitting so close to the ground."

The airport was soft and rough following heavy rains, but the *Commander* handled perfectly on the roll-out and we taxied back for take-off. Those BT-13 landing struts were designed to handle landings a lot rougher than the 4800-pound gross weight of the *Commander*.

After a quick mag check, we were in the air again. Since the runway was uneven, it seemed advisable to start the take-off roll with the control wheel all the way back to keep the pressure off the nose wheel. We hopped into the air in very little over 700

(Continued on page 60)

French Jet Bomber

The SO-4000 is a jet bomber in the *Canberra* class. Powered by two 5,000-pound static thrust Hispano-*Nene* jet engines arranged side-by-side, the SO-4000 has a top speed of approximately 528 mph. It has a wing span of 58 feet 7 inches and a 31° sweepback. The fuselage is divided into three compartments: pressurized cockpit, center fuel section, jet engine compartment in rear. SO-4000 seats two, has ejection seats.

By a Dam Site

(*Continued from page 27*)

for Monterrey, company pilots file a clearance with the U.S. Customs man on the job and sign an affidavit that they won't sell the airplane in Mexico. Upon landing, the pilot and his passengers clear in through the Mexican Customs and Immigration. On the return flight northward, the officials at the dam site expedite clearance. Since the airplane is legally quarantined until the Customs man arrives, the radio at the dam is a great help. Frequently, Amis planes are on the ground less than 10 minutes at the border.

A sample of the cooperation received on these huge construction jobs is evident at Monterrey where the Mexican affiliate of American Airlines placed its entire facilities at the disposal of pilots flying for the construction job, and all without charge. Their reason: the dam is to be a great help to the Mexicans living in that area, and they want to do what they can to assist.

One of the distant projects that the Amis firm helped build was the Potholes Dam (now called the O'Sullivan Dam) near Moses Lake in the state of Washington. The company Cessna flew the job superintendent and the project engineer from the Moses Lake job to Ellis, Kansas in 10 hours. They landed on the flight strip that had been scraped out of a flat spot near where the dam was to be built. There was no construction—nothing there at the time but this flight strip.

A month later these two men were picked up by Cessna and taken back to Washington, where they had just finished another job, to bring their families to the new construction at Ellis on the Cedar Bluff Dam.

The Amis company handles much of the highway construction for the state of Oklahoma. They may have as many as 12 or more different construction crews working in scattered locations at the same time. In a short-wave-equipped company plane, George Stiers, who is in charge of all these projects, can fly over each job. He checks the progress from the air and talks with the job superintendent via VHF radio. If any further consultation is needed, or if the job foreman has a problem he wants ironed out, the pilot tells him where he will land and the radio-controlled truck is usually at the airport waiting when the Cessna taxies up.

Before the company radio was installed, pilot Morris once had to walk two miles from a landing strip to the job headquarters. He could have flown back over the job and buzzed the office, but he started out walking and thought that a pick-up truck would come along any minute. It didn't—and next came company radio.

The Amis pilots discourage landing on highways—even their own that are under construction, because the surface is usually soft and rough. Whenever they have a job that is large enough to involve any amount of work at all, they have a motor patrol grader or caterpillar tractor clear an adequate flight strip. When the equipment is already there for the earth-moving job, it takes only a little extra effort to build a good flight strip.

Some of these temporary airports are so good that they remain on the map as landing fields. The Amis strip near the Canton Dam on the North Canadian River, was originally built for company planes, but after the project was completed, the Oklahoma State Aviation Committee put the field on the maps and continues to maintain it for sportsmen who want to fish in the nearby lake.

APOLLO, 40-seat passenger transport, powered by four 1270-hp *Mambas*, is the first transport plane to be fitted with axial-flow gas turbine engines. Fully loaded, the *Apollo* can fly over an 860-mile stage at a speed of 305 mph. On a proving flight to Paris, it made the trip from Coventry to Orly Field in 1 hour 26 minutes.

When a new job is started and trucks are to be moved from one job to another, the company Cessnas frequently shuttle truck drivers back for another load. When they are in the air, all company employees are covered by a $25,000 accident insurance policy. Both Amis brothers carry commercial licenses, and Mr. Morris has an ATR. He formerly flew for Chicago & Southern in DC-4's.

Company flying first began for the Amis brothers in 1943 when Rufus learned to fly and bought a *Cub Cruiser*. At this time the company was working on the Enid Flying School for the Army Engineers. In the next two years they built the Oklahoma City Air Base, the Tulsa Municipal Airport, Shawnee Airport, and in 1947 reclaimed river bottom land to form the Oklahoma City Downtown Airpark. Naturally, the three company Cessnas are kept in individual hangars at this field, located only two miles from the center of the city.

The Amis Cessnas are busy airplanes. Rufus has put over 500 hours on his airplane in the past year, and brother Bill logged nearly 600 hours last year. The company plane flown by Mr. Morris has logged over 800 hours in the past year. Here's a typical day for the company Cessna: Take-off from Oklahoma City at 5 A.M. and fly to Waco, Texas, to pick up a concrete superintendent to go to the Falcon damsite. There the pilot picks up the project superintendent, the executive secretary and the equipment superintendent for a trip to Ellis, Kansas. Had the weather been better, the pilot would have been back in Oklahoma the same evening before dark. As it was, he flew over 1600 miles that one day. Another recent four-day trip covered 3800 airline miles.

Weather is actually only a minor problem for these operators. Their hops are normally long enough so that they can plan their flights around the worst of the weather. The flat country around Oklahoma makes it a relatively simple matter to get back home under the weather most of the time. As with night flying, these operators attempt to keep their instrument flying to a minimum.

Complete instrumentation is installed in all three airplanes. Lear VHF with ADF and blind flight instruments make the Cessnas virtually all-weather aircraft. One Cessna has a Lear autopilot installed. So when either of the Amis brothers has business in Chicago they can take-off at dawn, be in a downtown office by 10:30 to transact their business, and be home the same day.

The company pilot is in charge of seeing that maintenance is completed on all three aircraft. While he doesn't make the engine changes and do the major overhauls himself it is his responsibility to see that the work is done properly. A spare Jacobs engine, overhauled by the factory, is on hand at all times.

In the type of business that the Amis company operates, the boys find it much more practical—and economical—to not put all their flying eggs in one basket. They found that they can operate their three planes for as little money as other outfits operate one large twin-engined craft.

There's a lot of aviation faith in the Amis brothers. Rufus is currently President of the Oklahoma State Aviation Commission. In addition, the two brothers were directly responsible for bringing the Aero *Commander* to Oklahoma City for manufacture and they own a substantial portion of the company. Bill Amis' son, David, age 21, has just entered the Air Force as a cadet.

So the next time you fly over a dam site take a good look around the immediate area. If there's a flight strip in sight, it's a good bet that one of the contractors on the job is Amis Company of Oklahoma City.

Your Own Strip Lights

(*Continued from page 23*)

some uneasiness developed as our driver had chosen to call on some friends and had not returned. It was about four when the call came to get wraps on four children and speed to the airport.

By the time we arrived at the airport and had loaded everyone into the Stinson, it was almost sunset. Home would be 35 minutes flying time, including pattern distance so a last-minute conference was held to decide whether or not to go. A quick review showed that everything should be okay to continue the trip. It was a grand flight at night with the yard lights of the various farms shining up through the darkness that had set in about half way home. I got a weather report enroute so knew the direction of landing. We would circle Danforth, and come in from the north. During this downwind leg we would be able to observe our lights and judge our approach accordingly.

No sooner were we on the downwind leg, however, than I realized the lights were not all there. Of the 12 flares set out, only five were still burning. But circle we did . . . and land too. By some good fortune the end of the runway did have a live flare and the other four were scattered so we did have a semblance of an outline.

That evening we definitely decided that electric lights were the only answer. But electric lights were out of bounds, financially. If we could devise some way to lay the wire ourselves, that would take care of about half of the expense. Later, another idea came. If the ground wire is really a ground wire, why wouldn't the ground do the job? It should, because a positive wire will short out on wet ground.

Some experiments were carried out and the following was the result:

A knife affair was built that could be attached to the tractor and controlled by the hydraulic system. It was formed from an old grader blade. This knife being vertical could be forced into the ground and held at a specified depth for cutting a "ditch" three-fourths of an inch wide. The tractor wheel following would roll the "ditch" shut and the wire would be covered. A piece of half-inch pipe was welded to the back side of the cutting blade to shield the wire as it was unreeled into the ditch. To relieve any drag that might occur, a grooved wheel was placed in a guard below the pipe for the wire to go around as it made the last turn at the bottom of the ditch.

We next purchased 4,000 feet of trench wire, 20 weatherproof sockets and a time clock. The wire was laid single along 1400 feet of taxiway to the airstrip and at a depth of one foot. Along the 1800-foot airstrip where lights were to be placed a loop was pulled above the ground for a connection to the weatherproof socket. Also, at each light on one side, a lateral line was run to the other side of the runway, giving lights on both sides with a considerable saving of wire in my case since the strip is slightly narrow. On the neutral side of each light socket a four-foot ground wire was connected and stuck down in the ground. The soil is now taking the place of the second or neutral wire.

The time clock was installed inside for protection and all neutral connections grounded well. Lastly, the underground cable was attached. All connections underground had been made moistureproof. All connection at lights were above ground so were rubber- and friction-taped.

Before the 15-watt bulbs were installed, pieces of sheet metal, 30 by 24 inches, had one-by-one-fourth-inch holes cut in the center, and then the sheets were bent at right angles. Each of these pieces serve as a roof over each light socket and connection. In addition, the metal sheets are good markers because, with a good coat of white paint, they are visible from the air for several miles. Each marker-roof is set on the ground with the hole directly over the weatherproof socket and the 15-watt bulb is screwed in securely. This roof idea keeps the light above the grass and keeps the direct sun rays from rotting the rubber in the socket or wire.

The entire project has resulted in a cash outlay of slightly under $225.00 and the operating cost of our 20 lights is the tremendous sum of two-thirds of a cent per hour. In contrast, our undependable flares cost us 42 cents per night.

It seems possible now that at very nominal cost the small private airstrip and even larger airports can have all the advantages of the municipal fields. And I believe if you were in the air and wanted lights, you'd gladly write a check for that much to get down safely, especially if the wife and kids were along.

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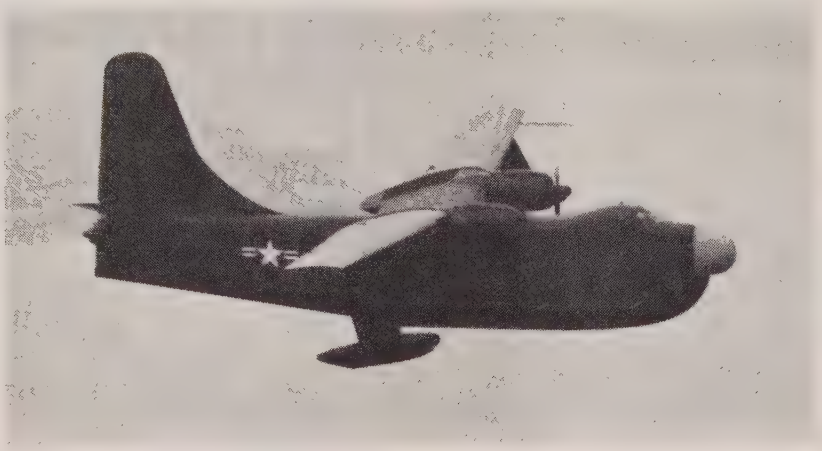
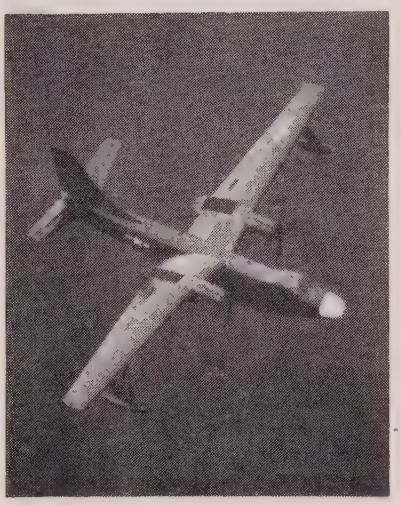


MARTIN MARLIN is the U. S. Navy's newest anti-sub flying boat. It is equipped with the latest electronic devices for detection, destruction of enemy subs

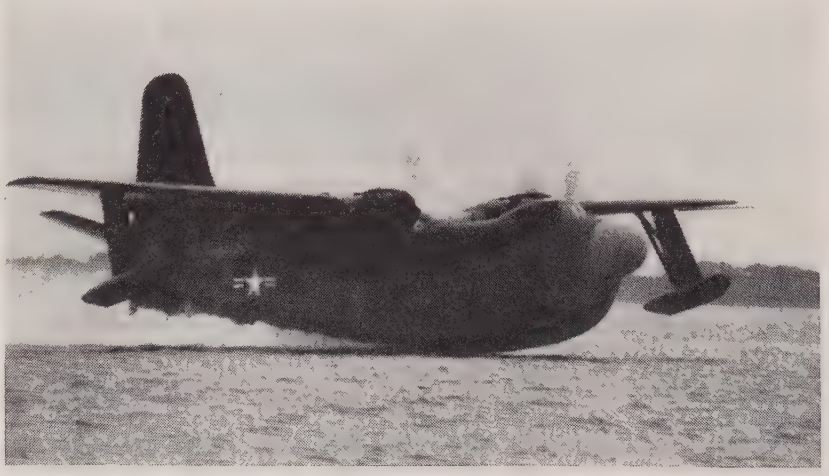
Anti-Sub Weapon



NOSE of the *Marlin* houses much of the huge seaplane's electronic equipment

Called "the most deadly anti-sub weapon," the Martin P5M-1 *Marlin* flying boat made its initial flight recently. The huge, gull-winged seaplane is powered by two 3,250-hp Wright Turbo-Compound engines. In size, the U.S. Navy's *Marlin* is comparable to the *Mariner,* but is of completely new design. The P5M-1 has a wing span of 118 feet and is 90 feet 3 inches long. Extensively equipped with electronic devices, the *Marlin* was designed especially for the detection and destruction of enemy submarines. Its radar gear makes possible the detection of even a snorkel-equipped sub. Installation of the Wright Turbo-Compound engines in the *Marlin* gives it extra power for take-off from rough water and extreme fuel economy for long-range patrol flights. No performance details are available.

MARLIN'S HYDROFLAPS, underwater rudders on each side of the hull near the tail, add to plane's maneuverability. They are operated from the cockpit



Night Strike

(Continued from page 29)

Your senses are a little less numb now and you carefully adjust your electric flight suit to the desired temperature and manage a grin as the warmth begins to soak in. Around the cockpit, you check your list: "Wings spread and locked, radios on, IFF code set, trim tabs set, armament switches off."

You hear your strike leader call for taxi instructions. You blink your lights, two wands wave you out of the chocks, and you creep along between two rows of blue lights that lead to the service runway. You swing into position alongside your strike leader and run up your engine. While you check your engine you hear the tower clear your leader to "roll." Into the wind and you see his lights race away and finally lift into the night.

You taxi on to the runway and line up, last check: "tailwheel locked, brakes off." You feel the engine surge as you ease the throttle full open. Yellow runway lights creep, then hurry, then streak past you as you ease up away from the runway. Airborne, wheels up, you squint into the black, looking for your leader's lights. You mumble to yourself, "Just like flying around in a black top-hat. Where did he go so quick?"

You finally pick up his lights as he begins his turn, climbing around the field. Away from the field and still climbing, you join up on his wing. The blue exhaust flames flicker and glow from your engine, and in the dim glow of his instrument lights, you see the faint outline of his face and shoulder.

Your earphones crackle: "Dark Hoss seven, this is six, go to button seven." You switch to channel seven and hear Dark Hoss six report in . . . "Two F4U-5N's, flares, frag' bombs, and full 20-mm's. Due off station at 0400. Over."

"Roger Dark Hoss Flight, this is Destruct Able, your mission: 'road recon' area Charlie to Dog and return. Good hunting, Destruct Able Out."

You're on your way now and you're awake. Your thoughts wander all over, about your wife, your kids, your last liberty in Japan, and how you wish summer were here. Why don't these damn people give up, don't they know they're beat? . . . Gawd, how I'd hate to be down there in that snow.

The flight leader calls: "Dark Hoss seven, this is six, spread out and I'll leave a tail light for you. Dowse your lights."

"Dark Hoss six, seven, Roger out." As you pass over the reservoir you think about the Marines down there and you shudder. You are approaching your target area now—10,000 feet and just 20° below zero outside at this altitude. Below you the black night is interrupted by the faint outline of the snow-covered mountains that seem to stretch endlessly in all directions. Fires burn here and there on the horizon and you wonder if some of your buddies set them off or if the boys on the ground did it.

Another five minutes and . . . "Hello Dark Hoss seven, lights up ahead, see 'em?"

"Seven, Roger."

"Seven, I'll make a flare drop this pass and you follow with your first run."

"Roger six, seven Out." You go over your ordnance check and your guns are ready to go . . . "Dark Hoss seven, flares away."

"Roger six, it's a live one. Starting the n, south to north." You ease the nose down d all the dreams, the cold outside, your rm 'pad,' fade and you are concentrating your business. You go steeper, faster. e mountains seem to have swallowed you. u see a ball of light break ahead of you, flickers and swings and descends slowly. neath it the mountains rise steeply in the are of the flare. In the valley along the rrow winding road, you see them: three, r, maybe eight. You blaze away. You it, then you see the tracers hitting and ing wildly back into the night. You start r pull-out and a soft grey curtain comes wn over your eyes and your hands are avy on the controls. Level, you turn and k back, no fire. "I must have missed 'em."

"Dark Hoss six, starting my run."

"Roger, seven Out."

You climb and look down. You see your der's guns cutting a pattern in the dark. wd, he's steep. Wham! The hillsides light He's got one, then another blows and u can see by the fire that two more are the road. The flare is out now but the o fires are burning bright orange and u've knocked out four for sure.

"Dark Hoss seven, this is six, save your d and we'll go on up the valley."

"Dark Hoss seven, Roger Out." Not bad, t think. You bet those guys got a 'bang' r of that.

Back at 10,000 now, and a cold moon is ginning to show on the horizon. The faint hline of the mountains shows a little more arly.

"Dark Hoss seven, I've lost you, go ahead your 'angels,' I'll go to 11,000, Dark Hoss , Out."

You're alone now and you see two sets of hts. You ease over and start down. You it and now you're below the mountain s. Down in the valley you start firing. u're hitting, and out go the lights. He's fire and you pull up, shove the throttle the way open and up past the snow caps into the black again.

"Dark Hoss six to seven, did you 'fire' the k that's burning?"

"Dark Hoss six, seven, Roger. I'm climbing angels' '9,' Over."

"Roger seven, I'm at '10' and about four es northeast of you. Your 'angels' OK... en Out."

You cruise along watching the road and oing 'six' will find a 'load.' You check ur watch and you have one hour left on tion. The time has slipped by, and you glad. Ahead of you a flare stabs the k. "Dark Hoss six, starting a run."

"Dark Hoss seven, Roger." You watch, two flashes tell you that 'six' has dropped frag' bombs. He's strafing now and a lding is burning. There's a flash of light oss the snow . . . probably fuel.

He reports: "Dark Hoss six, climbing to gels' '10.'"

"Dark Hoss seven, Roger."

You're headed south now and fires started lier give an eery light as they smoulder l burn. Off in the distance you see a flare. u know the B-26's are flying or maybe your relief finding targets already. Dark ss is calling Destruct Baker, "Can you use . . . 30 minutes left on station . . ."

"Roger Dark Hoss six . . . proceed south . . ." and he talks you into his area, ng fires and the reservoir for check points.

(Continued on page 56)

TWA'S 4-0-4 is shown here during its initial flight from Martin Airport. This is the first of 103 of this type on order: 41 for TWA, 60 for Eastern, 2 for CG

Newest Commercial Airliner

The first of the U.S.' newest commercial airliners, the Martin 4-0-4, made its initial flight recently. Destined for TWA as part of an order for 41, the white-painted twin-engine transport made its flight from Martin Airport, Baltimore. Powered by two Pratt & Whitney R-2800 engines, each developing 2400 hp, the 4-0-4 seats 40 passengers and has pressurized cabin and cockpit. Props are three-bladed Hamilton Standard. The airliner has a crew of three: pilot, co-pilot and stewardess. The 4-0-4 is the first production airliner designed and structurally stressed for the use of turboprop engines when these powerplants are fully proved for commercial use. Martin 4-0-4's have been ordered by Eastern Airlines and the Coast Guard, and will replace the older twin-engine transport aircraft.

POWERPLANTS of the Martin 4-0-4 are Pratt & Whitney R-2800's. These will be replaced by turboprop engines when they become approved for commercial use

Tower Tips

(*Continued from page 17*)

Threatening weather made an approach to the field rather hazardous. A number of aircraft were approaching the airport under the conditions of lowered visibility. And a busy tower crew was doing a commendable job of keeping ships in the pattern out of each other's way.

As things will happen, my radio set began to act up and contact between myself and the tower became very garbled. What would have passed for clear and distinct conversation in the comfort of grandma's living room became well nigh impossible under those trying circumstances. Only by a slow and careful use of the above-mentioned radiotelephone code expressions was I able to carry on communication with the tower. And with planes flitting in and out of the clouds around me, it was a matter of no little comfort to be able to get through a message.

For purposes of this article, the main functions of the tower operator as related to the private flyer will be discussed. In no instance is the procedure difficult. One or two tries will convince you of its simplicity.

Let's first assume that you are all gassed up, you have your maps prepared, your engine started, and you are ready to get into the air. You will want to inform the control tower of your aircraft make and identification, your position on the ground, type of flight you will make (VFR or Instrument) and your destination. This will be the manner of your first contact with the tower.

Aircraft: "ATLANTA TOWER THIS IS RYAN ONE SEVEN TWO FIVE FOUR. ON SOUTH RAMP READY TO TAXI, VFR FLIGHT TO JACKSONVILLE, OVER."

You will then receive a reply similar to the following:

Tower: "RYAN ONE SEVEN TWO FIVE FOUR, CLEARED TO RUNWAY NINE. WIND EAST EIGHT. ALTIMETER THREE ZERO ZERO ZERO. TIME ZERO EIGHT FIVE FOUR."

Now what has the tower done? First, he has given you permission to taxi to runway nine. He will always give you the wind direction and velocity. In the case of altimeter setting and time, observe the use of the word "Zero." Always, for the sake of clarity, the figure "0" is expressed as "Zero," whether it is used alone or with a group of other figures.

For various reasons, it is sometimes necessary to obtain an air route traffic control clearance. This may be true whether flying VFR or Instrument. And on the coastal areas, because of national security, it is possible that all flights may be required to observe traffic control clearance rules. In such case, the airport traffic controller will relay clearance to the pilot through the tower operator. This would be done as follows:

Tower: "RYAN ONE SEVEN TWO FIVE FOUR. ATC CLEARS YOU TO JACKSONVILLE TO CRUISE AT SIX THOUSAND. OVER."

This clearance would allow you to fly to Jacksonville at the specified altitude of 6,000 feet. Unless ordered to do otherwise, you would maintain that altitude, regardless of VFR or Instrument conditions. You would acknowledge this clearance thus:

Aircraft: "RYAN ONE SEVEN TWO FIVE FOUR CLEARED TO JACKSONVILLE TO CRUISE AT SIX THOUSANI OVER."

To avoid misunderstandings, any dire tions from ATC should be jotted down. Wi this clearance received and acknowledge the pilot is ready to take off. The airpo traffic controller, through the tower, will no give permission for take-off. With this fin permission, the tower will issue any instru tions of special interest to the pilot.

Tower: "RYAN ONE SEVEN TWO FIV FOUR. LOCAL TRAFFIC: EASTER DC-6 FIVE MILES SOUTH AT ON THOUSAND, LANDING ATLANT CLEARED FOR TAKE-OFF."

Warned to be on the outlook for this DC entering the traffic pattern, the pilot answer

Aircraft: "RYAN ONE SEVEN TWO FIV FOUR, ROGER."

Unless some unusual emergency arise there will be no more conversation betwee the pilot and the tower after the take-o But to be prepared for such an emergenc the pilot should guard the control tow frequency until he leaves the control zon On occasion, the pilot may need to swit over to radio range facilities. Before doi so, he should request permission from t tower to make this change.

When approaching an airport for landin the pilot ordinarily contacts the control tow for traffic instructions and landing clearan while still some 15 miles from the fiel Most of us are familiar with the thoughtle or careless flyer who suddenly appears the pattern with no advance warning. T the dismay of tower personnel and oth pilots, this type aviator proceeds to disru local operations while he "gets 'er down

Initial call-up for landing informati should include:

a. Position of aircraft.
b. Time.
c. Altitude.
d. Any needed information or clearance.

An example of this contact would be:

Aircraft: "COLUMBUS TOWER THIS BEECH ONE FIVE FOUR ONE SEVE NEWARK THREE FIVE AT THRE THOUSAND, LANDING AT COLU BUS. OVER."

Notice that the Newark fan marker dete mines the geographical position of the a craft. The numerals THREE FIVE followi denote the time. Often the last two numbe of the normal four-number time designati are used to save unnecessary use of the radi

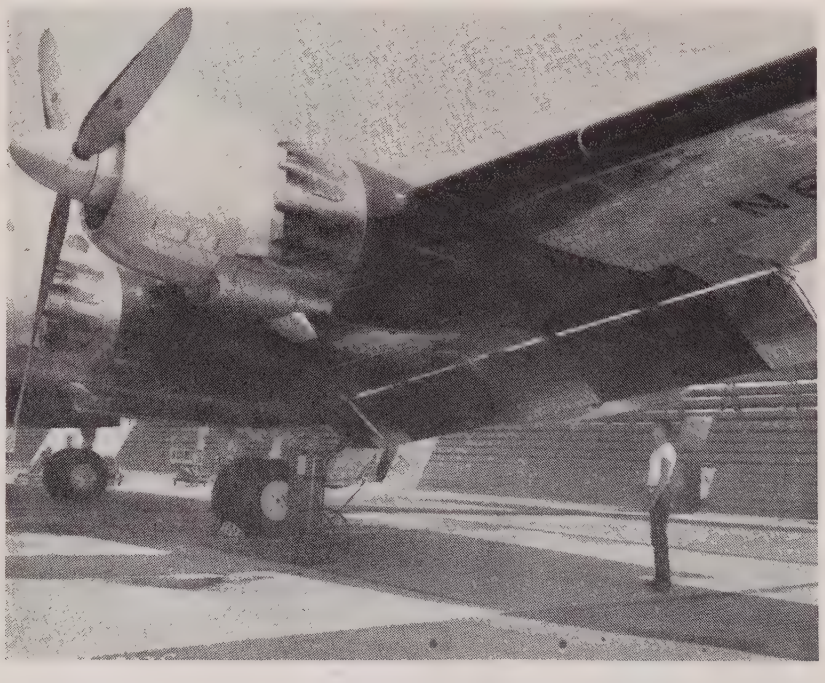
After the pilot has made the above co tact, the tower will acknowledge his messag Usually, he will be cleared to "enter t traffic pattern."

This clearance permits the pilot to ent the existing traffic pattern but does *not* gra him authority to land. The latter clearan will be withheld until the tower operat can sight the incoming plane and is ab to space him in the air with the other plan Tower acknowledgment will follow this forn

Tower: "BEECH ONE FIVE FOUR ON SEVEN. NEWARK THREE FIVE A THREE THOUSAND, CLEARED T ENTER TRAFFIC PATTERN. RU WAY NINE WIND EAST ONE FIV OVER."

From the above example, the pilot receiv wind and runway information which enabl him to plan his approach to the patter Once in the pattern, he should contact t tower as follows:

Aircraft: "COLUMBUS TOWER THIS



JET POWER calls for jet stripes, wide painted bands running across the wing aft of each engine of the *Constellation*. Jet stacks emit concentrated exhaust gases from sides of nacelles, giving extra force similar in effect to jet propulsion. These painted strips protect metal and hide the under-wing smudge

BEECH ONE FIVE FOUR ONE SEVEN. THREE MILES SOUTH OF FIELD AT EIGHT HUNDRED, OVER."

Provided it is practicable, the tower will hen give landing instructions.

ower: "BEECH ONE FIVE FOUR ONE SEVEN THREE MILES SOUTH OF FIELD AT EIGHT HUNDRED. CLEARED TO LAND. MAKE RIGHT TURN IN."

If there are other aircraft in the landing attern, the tower will designate order of nding. This helps to space aircraft and romote safety. Then the pilot will acknowledge:

ircraft: "BEECH ONE FIVE FOUR ONE SEVEN, ROGER."

During the final glide and after landing, e pilot should continue to listen for inructions from the tower. Transient pilots e not expected to be entirely familiar with range airports. It is not uncommon for -C flyers to become completely lost among e myriad of runways and taxi strips at me of our larger fields. And this at night in the daytime. At one field, a private lot landed well within the first third of e runway. Instead of turning off on to a xi strip, this chap leisurely chugged down e field. Because he had removed his earones, he could not hear the tower operator plore him to get off the runway. And uick. Suffice it to say that he got a start hen the plane behind him pulled up over s head.

No reflection is cast upon the pilot who ks the tower for taxiing instructions. ather, this cooperation is expected. And dio contact between tower and pilot should e continued until the airplane is parked.

A few special services of the tower operar may be of interest to the private pilot. addition to tower facilities, the CAA aintains communication stations at key ots. Often located at or near main aerial rminals, these aids are designated by the rm "RADIO." For example: CLEVELAND ADIO, COLUMBUS RADIO, etc. These e distinguished from CLEVELAND TOWR, COLUMBUS TOWER, etc., in that the tter regulate airplane traffic. The RADIO t furnishes in-flight navigational help, eather, etc. When on a X-C jaunt, the rious RADIO stations should be contacted r information.

A very close coordination is maintained tween all TOWER and RADIO personnel. is not unreasonable that a TOWER facility ay be contacted when communication with RADIO station is impossible. In this case, not hesitate to call a TOWER for inforation. I have received data from TOWER perators when I could not get through atic to RADIO. A friend of mine, while ying for a record try, used both RADIO d TOWER help to determine weather inimums at his destination some 1,000 miles way.

And don't forget the extremely helpful iends in the tower in case you are lost. ive them a call. They will relay your preicament to direction finding stations and sist you in every way possible.

Our government expends vast sums to ain and maintain tower personnel. Unubtedly, they rank high in the everproving efforts to achieve flying safety. A reful and systematic use of tower produres will do much to make your flying urs long and pleasurable.

Can YOU Name It?

It shouldn't be too hard for you to quickly name the airplane above—it appeared in a Skyways feature in July. Before looking below for the answer—study the photograph—see how close you can come to it. However you make out—fill in the coupon on this special subscription offer and have Skyways handy to keep you abreast on the latest in the air.

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10-51

North American Fury (FJ-1)

AIRMEN of 86th Wing *(above)* climb aboard "Flying Library" to pick out books. Spare time now is reading time for Sgt. Vaughn *(below, right)*

Air Force Library on Wings

A library that sprouted wings serves U.S. jet pilots in Bavaria. Members of the 86th Fighter-Bomber Wing recently packed up their gear and followed their F-84's to Giebelstadt, 180 air miles northwest of home base. During the day the maneuver area was a beehive of activity. But all work and monotonous leisure make an airman dull. So, the "Flying Library" was born, thanks to Barbara Pearson, Neubiberg Base librarian. She secured permission to have books and magazines flown to the maneuver site. Men of the 86th are now among the best-read airmen. Twice each week Miss Pearson and an assistant fly in books and mags.

LIBRARIAN Barbara Pearson checks shipment of books to maneuver area while Cpls. Harris and Speaks hand them up to Cpl. Bullock in the cargo C-47

Night Strike

(Continued from page 52)

"Dark Hoss, this is Destruct Baker, we're getting mortar fire from the ridge just back of the big fire on the north side of the reservoir . . . do you have that in sight? . . . Over."

"Roger, Destruct Baker, we'll give 'er a go."

You circle, hoping to see flashes that will give away positions.

He commands: "Dark Hoss seven, drop your flares in that area and we'll have a look."

"Dark Hoss seven, Roger." You push over and 'pickle off' two flares about four seconds apart. One ignites and the other is a dud.

"Dark Hoss six, starting my run from 'angels' '9,' south to north. I'll break to the left, Out." You circle and watch. His '20's light up the ground as they explode and race off the frozen hillside. He's off the target now. You push over and go in strafing. One gun quits, then another, you're holding the trigger and nothing fires. You climb out again and head south.

You report: "Dark Hoss six, this is seven, I'm empty, over."

"Dark Hoss six, Roger out. Hello Destruct Baker . . . Dark Hoss flight reporting out . . . no fires on the last target . . . hope we quieted 'em down a bit. We're due off station at 0400, Over."

"Roger Dark Hoss six, thanks for the cover. Report in to Destruct Able before leaving station. Destruct Baker Out."

It won't be long you think . . . back to that warmth. You check your fuel. Plenty, if you're not going far, and you're not.

Dark Hoss six has your flight checked out with Destruct Able and he's calling the tower for permission to enter the traffic pattern. A sleepy voice clears you in with wind velocity, direction and the runway in use. You see your leader's lights go bright and he 'breaks.' You follow, gear down, flaps down mixture fuel rich. You turn off the 'down wind' and head into the final approach. In the 'groove' you see the lights line up and you ease off the throttle. You settle on the runway and feel the wheels rolling under you. Tailwheel down, throttle off, you roll out as your ears pop.

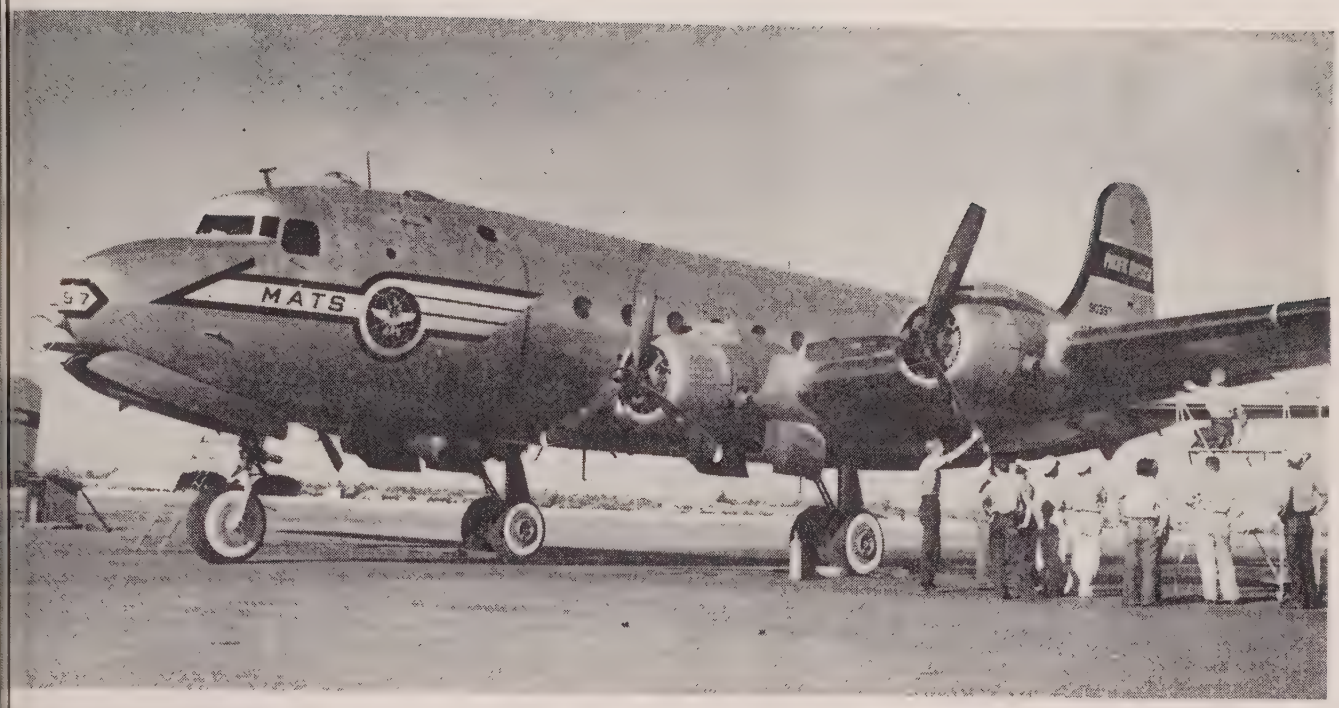
The tower clears you off the runway and to your line. A signalman picks you up with his wands and you are parked. You cut your engine and switches off. You ease out of the cockpit and the cold wind hits your stiff bones. You pull up your fur collar and head for the line shack. A refueler is already in front of your plane and the crew is climbing over it. An ordnance man asks, "Guns fire OK? How about your frags' and flares . . . ?"

You give him the dope and he smiles for he knows his time has not been wasted. In the line shack you fumble for a cigarette and sign the yellow sheet. The plane's okay for another hop.

At the chow hall you drink stale hot coffee and it's good. You smoke another cigarette and it tastes awful, just like the last one.

Finally, you are getting out of your flight gear. Martin is groping in the dark just like you were doing four hours ago. You smile, you're in the 'pad' again . . . you think about . . . wonder what your wife's doing.

It's quiet again, except for Martin shutting the door and guys breathing deep.



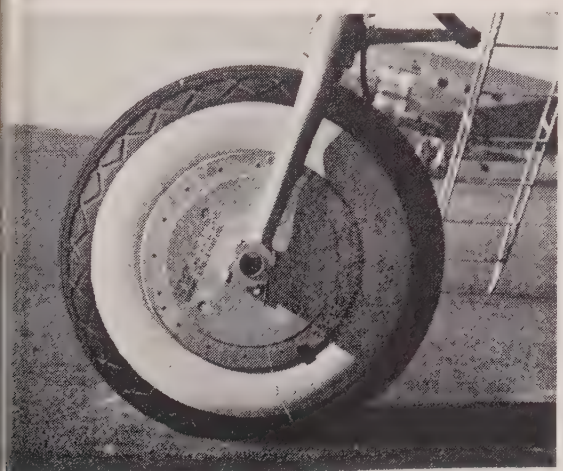
LUSH R5D'S—White sidewall tires are not only pretty but also very practical. Plane's gear is easy to spot on night landings

"Plush" Planes

ver see an airplane with whitewall tires? They're the latest for the Douglas R54's of VR-8 in Pacific Division, MATS. "If we're going to run plush ps," said LCDR John Lafferty, we might just as well ke 'em look good, too." And so . . . came white side- ll tires. They are practical as well as pretty. At night y show up clearly, indicating to the control tower at the R5D's have their feet down, ready to land. One ne the green panel lights failed on a plane trying to d on a very dark night. The pilot was sure his gear s down and properly locked, but to make certain he ed the tower to look and see. The pilot had to make ee passes and fly so close the tower shook, before e officer could see the wheels in the darkness. Not with these whitewall tired Navy R5D's in Pacific vision.

CREWMAN E. H. Rehder sprays on first coat of paint while W. W. Moore *(left)* and L. F. Walker *(center)* look on. White sidewalls cost no more than black

AINTENANCE should be no problem insomuch as es are washed each time a VR-8 plane comes in anyway

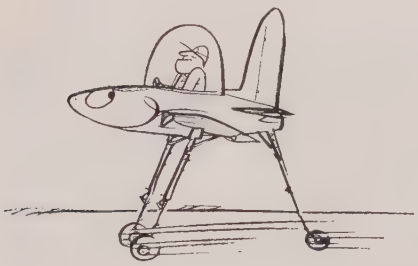


Dilbert

(*Continued from page 30*)

it up by changing his mind at the last moment. For the love of Mike, don't pull a Dilbert by changing your mind near the ground.

Leave Them Down—The other day a pilot with almost 2,000 hours flight time made like Dilbert. He had difficulty in raising his wheels after take-off. He finally managed to retract them by means of the hydraulic hand pump.



The flight was uneventful, but when he came in to land he was unable to get one wheel down and locked. He went back up and tried everything in the book, but still no soap. Almost out of gas, he finally was forced to make a one-wheel landing. It wasn't a Happy Landing; the plane was a complete wash-out.

Since an Oldtimer missed the boat on this one, we're going to have to spell it out. It shouldn't take too many brains to figure out that when your landing gear is difficult to raise, it probably will be just as difficult, if not more so, to extend and lock. And your wheels must be down for a safe landing.

So-o-o, if circumstances permit when your landing gear sticks, do not attempt to *force* the gear up. Instead, concentrate on relowering and locking it for an immediate landing—to give the experts a chance to trouble-shoot it while the plane is still all in one piece.

Great mishaps from little mistakes grow.

Three to Make Ready—Dilbert was plenty surprised the other day when he had a collision while parked—repeat—*while parked.* At least, he thought he was parked. And he shouldn't have been surprised; he was in the airplane at the time.

Mechs who saw it said the chocks just slipped out of place (were they set correctly? were the brakes set?) and the plane began to roll. Dilbert wasn't in sight—he had his head buried in the cockpit, diligently checking instruments.

The mechs were too far away and all their yelling couldn't stop the plane. When it crashed into two other parked airplanes, Dilbert came out of there right now, just as though he had been exploded out with an ejection seat. He lit with a great, great big "Wha' Hoppen" expression on his face, and seemed to think the other planes had backed into him.

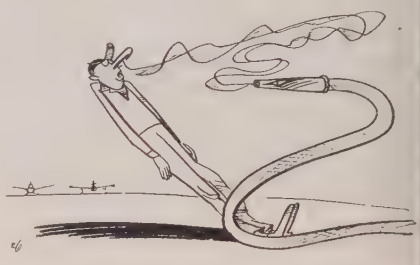
Time out—plenty of time out—for expensive major repairs to three airplanes. Let's hope Dilbert puts the time to good use by briefing himself on how to prevent useless destruction of this sort.

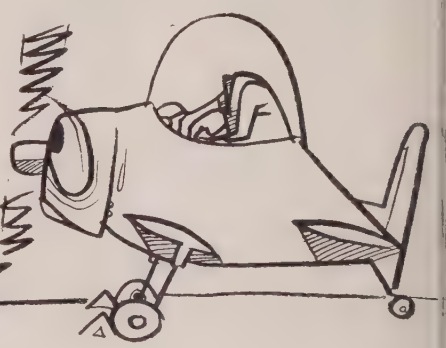
Brother, you can't taxi on instruments!

Gas Fumes are Toxic—Gasoline is nothing to fool around with, especially aviation gas. First, there is the danger from explosion. It's flash point is so low that you even have to ground the gas hose so that a static spark won't set it off. That is pretty well understood, only don't get careless.

Then there is the danger of lead poisoning. Most mechs know that when they spill high octane gas on themselves and fail to scrub the exposed skin with soap and water, they are laying themselves open to a serious dose of lead poisoning.

Not so well known, however, is the fact that the tetraethyl lead contained in high-octane gasoline can also be absorbed into your system by breathing. And inside it is even more dangerous than on the outside. Medical investigation has proved that a concentration of this vapor as small as one per cent is dangerous, while exposure to a two per cent concentration may be fatal. Such percentages are readily obtained when aviation gasoline is spilled in a confined space. If this happens to you, get the hell out of there until the space has been thoroughly cleared by ventilation.



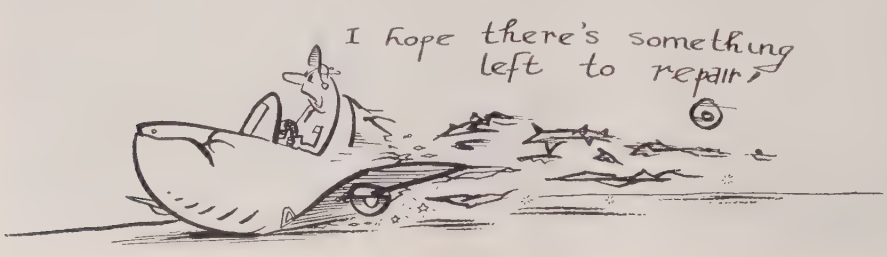


SETH'S SAFETY QUIZ

1. If you are able to limp back home with a crippled airplane, should you bother to call the tower and inform them of your predicament?
2. Is airspeed alone a guarantee against stalling?
3. What kind of a landing should a seaplane pilot make on glassy water?

ANSWERS

1. By all means, so they can clear the field and be ready to render any assistance necessary.
2. No. If sufficient acceleration ("g") is applied, as in a dive pull-out or sharp turn, an airplane can be stalled at terminal velocity.
3. Always a power-stall, because of inability to judge altitude correctly.



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AERONCA

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BONANZA B-35s #6340CB. 450 hours engine, airframe. Licensed March 1951. Recent new tires. Very clean and ready to go. Located in midwest. $10,900. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

TWIN BEECH AIRCRAFT C-18-S. #56898S. This converted C-45 has custom interior by major automotive factory. Plane was never used by Armed Services. 1800 hours total time on airframe. 360 hours each engine since Pratt & Whitney overhaul. Cabin radio with speakers. ADF, LF, VHF. You must see this plane to appreciate. Located in midwest. Make offer to McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

TWIN BEECH AIRCRAFT D-18-S. From $38,750. #92417S. Engines, hydromatics, and airframe zero time since major. Converted from Continental engines. Five reclining seats. Card table. Dual blind instruments. Super soundproofing. New Tires. Many other extras. $50,000. Inquire McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

BONANZAS: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

D-18-S TWINS: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

BELLANCA

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BEECH D-17-S Complete Equipment, always hangared, seat chutes, excellent condition $4,000. Haydu, 4 Chestnut Street, East Orange, N. J.

CESSNA

CESSNA 195s. #5544N has 182 hours engine, airframe. Licensed April. Primary blind instruments. Never damaged. Always hangared. In perfect condition. Asking $11,750. Located on West Coast. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

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TWIN CESSNAS. #63674 is perfect executive Cessna. Converted at cost of $30,000. Has 50 coat hand rubbed white finish with red and gold trim. Upholstered in top grain Cadillac red leather. Foamex cushions. Special heating and ventilating. Complete radio with ADF, VHF. Is in hangar storage under cloth cover. Owner wants offer. Located in midwest. Inquire McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

CESSNA 170-As. #0439AS 1949 model all metal. 130 hours on engine, airframe. Primary blind plus Kolsman compass. VHF, LF, Speaker. Landing light. Perfect condition. $5500. Located in midwest. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

120 FLOAT-PLANE: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

170'S: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

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CESSNA 120's, 140's, 170's, 195's, available. All good buys—as low as $995.00 for 120's . . . $1300 for 140's . . . $3500.00 for 170's. 18 months to pay. Airmart Aircraft 1930 S. State, Chicago 16, Illinois.

DOUGLAS

DOUGLAS DC-2. 14 passenger airline ship. 3600 hours total time airframe. New license on sale. Excellent airline radio. Useful load 5,910 pounds. Toe hydraulic brakes. Hydraulic gear retraction. $30,000.00. Located in Southwest. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

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GRUMMAN

WIDGEONS—8 Available. #9234H has 15 total time each engine. 65 hours total time airframe. New Custom interior. Licensed June 1951. ARC-17 and RCA radio. Overhead radio panel. Circuit breaker electrical system. Modified and vented hull step. Converted for corporation plane and never used. Make an offer if you want the best G-44 available. Located in midwest. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

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WIDGEONS: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

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LODESTARS, 10-As, 12s, Available. Let us have your requirements. Descriptions sent upon request. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

NAVIONS

NORTH AMERICANS. #9814HS has 296 hours total time. Fully painted blue and cream. Seat covers. Licensed March 1951. One owner since new. Never damaged. All bulletins complied. Located in southwest. $5495.00. McINTIRE ASSOCIATES, 50 North Ervay, Dallas, Texas.

RYAN NAVIONS. #4527KS. 225 hours on engine, airframe. Licensed July 1951. Custom upholstery. 205 HP engine. Full blind instruments. Two way VHF and LF. Narco Omnirange. Lear ADF. Extra sound-proofing and ventilators. Exceptional at $7950.00. Located in Southwest. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

RYAN 260 NAVIONS. File 340. 133 Hours on engine, airframe. Hartzell metal propeller. Auxiliary tank under rear seat. Curtains. Full blind military panel. Six channel VHF. Lear ADF. Lear Auto-pilot. Engine driven vacuum pump. This plane is equal to new. $18,000. Located in Southwest. McINTIRE ASSOCIATES, 505 N. Ervay, Dallas, Texas.

NAVIONS: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

NAVION, 5 available, #91426, 1947, 390 hours since new, perfect condition, licensed to May 1952, $5095.00. 18 months to pay. Airmart Aircraft 1930 S. State Chicago 16, Illinois.

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TRI-PACER: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

PIPERS all models available. PA-12 #456 1947 radio, basic blind, 356 hours total, perfect condition. $1490.00. We finance. Airmart Aircraft 1930 S. State Chicago 16, Illinois.

REPUBLIC

SEABEES. #6381K. 250 hours engine, airframe. Never in salt water. Fully painted white and red. Never damaged. Two way radio. Hartzell propeller. New license on sale. $1650.00. Located in Southwest. McINTIRE ASSOCIATES, 505 North Ervay, Dallas, Texas.

STINSON

STINSON VOYAGERS AND STATION WAGONS, many excellent values. #8287 Voyager 150. 650 hours since new, 130 since major, radio, omnigator with VHF, lights, a beauty. $2290.00. 18 months to pay. Airmart Aircraft 1930 S. State Chicago 16, Ill.

SWIFT

125'S: See POWERS & GEORGE display advertisement on page 39 of this issue. "Airplanes Everywhere".

AVIATION EQUIPMENT & SUPPLIES

GENUINE Navy Intermediate Flight Jacket, new, dark brown goatskin leather. Bi-swing back, two patch pockets, one inside snap pocket. Completely lined finest rayon. 100% wool knit cuff and waist. Zippered front. Sizes 34-46 only $32.50. Write for (Free Catalogue). We pay postage if payment accompanies order. C.O.D.'s upon request. No C.O.D.'s overseas. R.A.F. Mfg. Co., 2715 W. Madison St., Dept. SK-10, Chicago, Illinois.

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(Continued on page 60)

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(*Continued from page 59*)

AVIATION EQUIPMENT & SUPPLIES

GENUINE Navy Intermediate Flight Jackets, brand new, dark brown goatskin leather, bi-swing back, two patch pockets, one snap pocket, mouton collar, celanese lined, 100% wool knit waistband and cuffs, zippered, sewed with nylon thread. Sizes 34 to 46. Price $35.00 each. The Genuine USN issue. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13 Ill.

FLIGHT DECALS available now for instrument panels, windshields, mirrors, etc., attractive, show instantly light gun signals, VFR minimum clearances, and cruising altitudes. Increase safety and ease x-c flying. Complete set only $1.00. Sorry, no COD's. Order yours today. Flight Decals, Fort Scott Airways, Fort Scott, Kansas.

BATTERIES & TIRES: Brand new, for all type aircraft. Bargains. Send for free list. Many other items; write your requirements for quotation. Flying Equipment Co., 1641-5 W. Wolfram St., Dept. S, Chicago 13, Ill.

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Pilot Report . . .

(*Continued from page 49*)

feet. Considering the 92° temperature at the time, the performance was excellent.

It was hot in the cabin, especially on the ground, but the prototype did not have the half-horsepower electric blower in the nose that will be standard equipment on all production models. This blower will serve as a fan for ground operation in hot weather and will be channeled through cabin heaters for winter flying.

The Downtown Airport is just two miles from the tall buildings that mark Oklahoma City. Our wide base-leg landing toward the south took us almost over downtown. Naturally, the airport is very popular with the flat-land pilots of this area.

Landing on a paved strip is easy after bumping along on a sod field. The *Commander* can be greased on just like an airliner should be landed, even after only a couple of tries. There is no reason why a relatively inexperienced pilot-executive should have any trouble with an airplane that is as responsive as this one. It's stable, docile and easy to fly.

By the time we had flown back across town and landed at the Tulakes Airport again, we had logged just over an hour in the airplane. Even in that short time, you find it perfectly natural to lead a turn on the ground with one throttle and stop it with the other. Engine run-up is pure repetition and the single-engine performance builds up the safety factor and eliminates the what-if-the-engine-should-quit fears of non-flying executives.

The manufacturers of the Aero *Commander* are so sure that there is a place in current aviation for this type of plane that they have bought all the materials needed for the first 40 airplanes. Deposits have already been placed on 20 planes. It is interesting to note that these deposits have been put in escrow pending delivery of the new planes. No money from deposits has been used for tooling, material or labor.

Optional equipment includes a cargo door on the left side of the fuselage for carrying freight. Seven seats with leg room equal to an airliner can be installed. To make room for this additional cabin space, the fuselage of the production airplane was lengthened 26 inches and made with nearly square sides rather than the rounded cross-section of the prototype. The added length has the further advantage of putting the pilot a greater distance ahead of the engine nacelles and increasing his rearward visibility.

It's an airplane designed for a specific market—an executive transport for a company that can pay the $45.000 to furnish their key personnel with private airline service at nearly 200 mph with honest multi-engine dependability.

You'll undoubtedly be seeing many of these little transports shuttling busy executives in and out of unimproved fields adjoining construction projects, etc. And you'll undoubtedly see the executive himself at the controls. This ship is so easy to fly safely that it won't take an Airline Transport Rating to handle the job.

So if that one engine quits on the Aero *Commander*, you feather the prop and go on about your business. It's a business man's airplane.

NAVICOM

xpansion of ILS Now Under Way

Accompanying chart shows frequency assignment plan for United States

)uring the Transition Phase of the mmon System of all-weather air navi- ion, traffic control and landing aids, erica's airways are being built around y High Frequency (VHF) radio in 108.0 to 136.0 mc band.

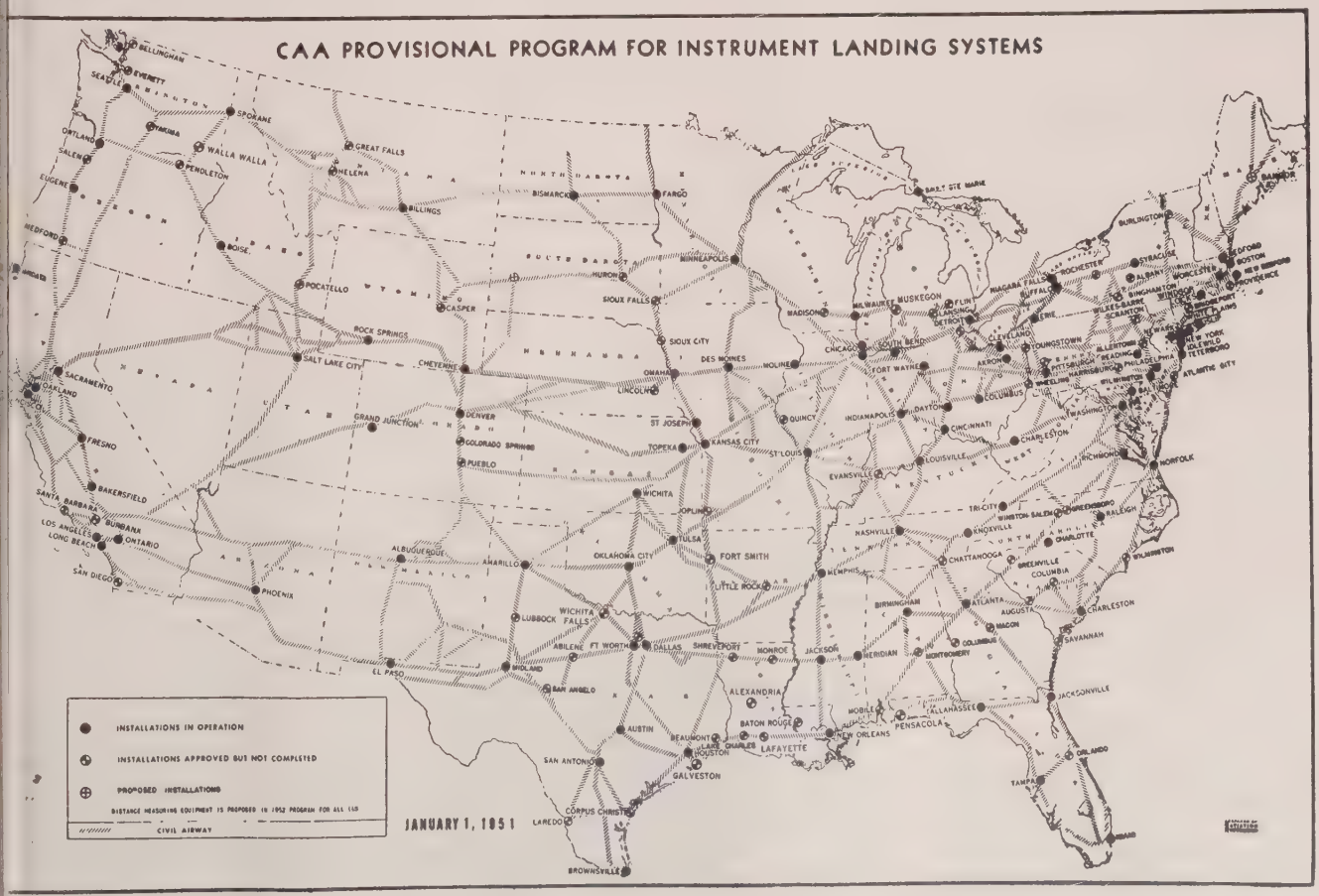
The Radio Technical Commission for onautics (RTCA), in cooperation h the Federal Communications Com- ssion (FCC) and the International il Aviation Organization (ICAO) ned out a standardized channeling em for approach aids (108 to 111), navigation aids (112 to 117 mc), l communications (118 to 136 mc). VHF channels assigned to ILS local- frequencies are from 108.1 mc to .9—39 channels in all. Channels for glide slope frequencies are in the UHF band and run from 328.6 mc to 335.4 mc, or 20 channels. The glide slope frequencies have been paired with the localizer frequencies on a one-for-two basis, with a full 2-mc spread in the localizer channels assigned to a glide slope channel. For example, 108.3/335.0 is one pairing, and 110.3/335.0 is another; the glide slope frequency 335.0 mc can be paired with 108.3 mc localizer and also with 110.3 mc.

Equipment ▶ This is a long range program, however, and assumes the availability on a large scale of airborne glide slope receivers with channel spacing reduced to 300 kc (.3 mc), which would provide the necessary 20 channels in the assigned UHF band. The Collins 51V-1 Glide Slope Receiver is one piece of equipment which provides 20 channels for glide slope signals, but its price, weight and limited production status combine to keep it from widespread use at the present time. Schuttig & Company of Washington, D. C. has produced under CAA contract a 20-channel glide slope receiver, Type S227A, which is now undergoing company tests before being turned over to CAA.

For the Transition Phase of the Common System, the RTCA Special Committee 57 (SC57) has come up with an interim priority plan for the assignment of ILS localizer/glide slope frequencies which meets present conditions realistically.

One attractive feature of the plan is that a simple modification of the R89B glide slope receiver makes possible the addition of eight ILS frequency channels. The type R89B (or AN/ARN 5B) was developed as a three-frequency unit, and as a war surplus equipment has been widely used by domestic and foreign scheduled airliners and corporation aircraft, as well as by military

(*Continued on page* 63)


CAA PROVISIONAL PROGRAM FOR INSTRUMENT LANDING SYSTEMS
INSTALLATIONS IN OPERATION
INSTALLATIONS APPROVED BUT NOT COMPLETED
PROPOSED INSTALLATIONS
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Ground-to-Air Channel 111.1 MC Discontinued

Effective August 1st all Inter-State Airways Communications Service stations (INSACS) discontinued use of the 111.1 mc frequency for reply to private aircraft. This particular frequency was used as an interim measure pending the availability of other channels. It is now required for navigational aids (VOR).

The new channel is 122.2 mc, and this has been implemented by August 1st at all INSACS which do not have range voice channels, either L/MF or VHF, or both. This is about 10 percent of the INSACS.

Eventually all INSACS will transmit on 122.2 mc, but owing to the tight equipment situation (especially in transmitters) this will not be for some time. Meanwhile pilots should consult the *Airman's Guide* and current NOTAMS for information on frequencies available at specific locations.

Notice of this change was listed in the July 17th issue of *Airman's Guide*, with a special note calling attention to it on the title page. However, the word does not appear to have gotten around too well, and there were reports of considerable confusion during August.

As it takes several weeks to have the channelization changed in crystal controlled receivers, private and company pilots feel that more adequate notice and greater publicity should have been given to this major change.

Honors for SWG-5 Leader

Cmdr. A. W. Wuerker, USCG, recently received a commendation and ribbon from the Coast Guard Commandant, Vice Admiral Merlin O'Neill. The award was presented to Commander Wuerker for his outstandin work as chairman of the Operationa Policy Group (Special Working Grou 5) of the Air Coordinating Committee Air Traffic Control and Navigatio Panel (NAV-Panel).

The citation reads in part: "For mer torious performance of duty from Fe ruary 1950 to February 1951 as Chai man of the Operational Policy Grou Air Traffic Control and Navigatio Panel, Air Coordinating Committee. U on its activation, the group was co fronted with a technical problem o great complexity, and the task require coordination of a most difficult nature Under the capable leadership of Com mander Wuerker, the Group reviewe and analyzed the system in operatio and made special field trips to ascertai the problems of the users of the ai space. To determine the validity, rea sonableness and scale of accomplishmen for the Group's recommendations, successful demonstration was held a Wright-Patterson Air Force Base, unde Commander Wuerker's able direction using improvised equipments and ex treme aircraft types from jets to tran ports. The final report of the Group wil be used as a guide for the implementa tion of the common civil-military ai traffic control and navigation systen within the United States, and will be th basis for the expenditure of millions.

The "SWiG-5" report, entitled "Ai Traffic Control and the National Se curity," was the subject of a talk by it secretary, L. W. Burton, Jr., at th CAOA Forum in June (see Septembe *SKYWAYS*, pp. 37 and 51). He strongl recommended that all pilots should ge a copy of this report and read it. (It i for sale by the Supt. of Documents, U.S Government Printing Office, Washing ton 25, D.C. at 65 cents per copy.

SWG-5 CHAIRMAN Wuerker receives official commendation for his work. Witnessing th ceremony were *(left to right)* J. Sommers of ANDB; Bert Moore, CAA; Lou Burton, sec of SWG-5; Sam Saint, ATA; Vice Adm O'Neill *(far right)*. Comdr Wuerker is left of O'Neil

Expansion of ILS Facilities Now Under Way

(Continued from page 61)

planes of various types.

The ILS localizer which went with it was the RC-103A (or BC-733); this was a 6-channel set, but in many parts of the country three of its channels (U, V, and W—108.3, 108.7, and 109.1 mc) have been primarily used for VAR (VHF visual-aural ranges). The other three (X, Y, and Z, or 109.5, 109.9, and 110.3 mc) are the ones which have been primarily used for instrument landing localizers up to very recently.

Equipment-wise the localizer has not posed a problem as the standard postwar VOR (omnirange) sets receive ILS localizer signals as well as signals from VOR stations.

Modification ▶ The basic changes required to modify the R89B glide slope receiver are the addition of crystal holders, crystals and rewiring of control relays. For example, by the simple addition of one crystal (334.4 mc) two additional ILS frequencies are made available (108.1/334.4 and 110.1/334.4). Aeronautical Radio, Inc. (ARINC) developed a 10-channel modification of the R89B over 1500 of which were produced by Schuttig & Company for the domestic airlines. Some were also sold to company aircraft owners. A six-channel modification, the R89M, with CAA-approved Type Ctf., is being produced by Aviation Accessories, Fort Worth.

The RTCA SC57 recommended that this interim priority plan for ILS frequencies be adopted for full implementation by July 1, 1951 and that channels one through eight be implemented by local agreement on a regional basis. The CAA is now working to complete the program within the next few months.

The following table shows the priorities recommended by SC57, the ICAO channel numbers (selected from the complete list of 30 channels for the "ultimate" program), and the pairings of localizer and glide slope frequencies.

Priority	*Channel*	*Local'r*	*Gl. Slope*
1	23	110.3	335.0
2	19	109.9	333.8
3	15	109.5	332.6
4	3	108.3	335.0
5	1	108.1	334.4*
6	21	110.1	334.5*
7	17	109.7	332.2*
8	13	109.3	332.0*

**add crystal to unmodified R89B*

Priority refers to the order in which the frequency assignments were made in connection with the relative factors in each situation, such as altitude, distance from nearest VOR and/or VAR station, etc. In other words, if priority one, channel 23, 110.3/335.0 will suit a given installation, it would be assigned; if not, the next one would be, and so on down the line. That is why under the new plan several ILS channels in the heavy traffic region one are as low as priority seven and eight, while there are none below priority five in any of the other CAA regions.

The RTCA SC57 figured that priority one (the old channel "Z") would cover approximately 36 per cent of the country's presently planned ILS installations; priority two, channel 19 (109.9/333.8, the old channel "Y") would cover some 28 per cent; priority three, channel 15 (109.5/332.6, the old channel "X") about 14 per cent; and priority four, channel three (108.3/335.0, the old channel "U") about five per cent. This makes a total of 83 per cent for the top four priority channels. Modifying the R89B with three additional crystals (as above) will provide a total of four more ILS channels (priorities five to eight), which will cover an additional 16 per cent of the ILS airports, or 99 per cent in all with the modified R89B.

This brings out clearly one of the main purposes of the SC57 study and recommendations—to extend the useful life of the widely adopted R89B glide receiver.

As of August 1, 1951 there were about 105 ILS installations in actual operation, with some 35 more approved but not completed (see map). Details are shown in the *Airman's Guide*, the *Jepson Manual* and in the excellent ILS section of the U. S. Department of Commerce *Coast and Geodetic Survey Instrument Flight Charts.*

Mr. E. E. Estes of the CAA, who was chairman of RTCA SC57, has made available an up-to-the-minute revised copy of CAA's "ILS Frequency Assignment Plan for Continental U. S." The assigned frequencies for ILS equipped airports are listed by regions, any changes from the present frequency (usually to obtain a clearer channel) being indicated by an asterisk. Frequencies representing new installations

(Continued on page 64)

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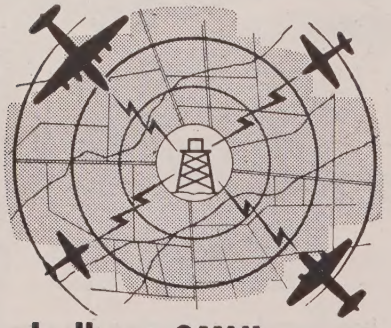

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Expansion of ILS Facilities Now Under Way

(Continued from page 63)

are shown by a double asterisk. The program for region one (where most of the changes occur) is shown complete; new installations (**) and changes in frequency (*) only, are shown for regions two to seven.

First Region

Airport	*Loc. G/S*	*Priority*
Albany, N. Y.	109.5/332.6*	3
Allentown, Pa.	109.7/333.2**	7
Atlantic City, N. J.	108.1/334.4*	5
Baltimore, Md. (Friendship)	110.3/335.0	1
Bedford, Mass.	109.5/332.6*	3
Boston, Mass.	110.3/335.0	1
Hartford, Conn. (Bradley Field)	110.3/335.0	1
Bridgeport, Conn.	109.3/332.0**	8
Binghamton, N. Y.	110.3/335.0**	1
Buffalo, N. Y.	110.3/335.0*	1
Burlington, Vt.	110.3/335.0	1
Charleston, W. Va.	110.3/335.0	1
Erie, Pa.	110.3/335.0	1
Harrisburg, Pa.	108.1/334.4*	5
Islip, N. Y.	110.1/334.4*	6
Newark, N. J.	109.9/333.8*	2
New York, N. Y. (LaGuardia)	110.3/335.0*	1
New York, N. Y. (International)	109.5/332.6	3
New Castle, Del.	110.1/334.4*	6
New Bedford, Mass.	109.7/333.2*	7
Niagara Falls, N. Y.	109.7/333.2*	7
Norfolk, Va.	109.9/333.8	2
Philadelphia, Pa. (International)	109.9/333.8	2
Pittsburgh, Pa. (Allegheny)	109.5/332.6	3
Pittsburgh, Pa. (Greater Pittsburgh)	110.3/335.0	1
Providence, R. I.	109.3/332.0*	8
Reading, Pa.	109.5/332.6	3
Richmond, Va.	110.3/335.0*	1
Rochester, N. Y.	109.9/333.8*	2
Syracuse, N. Y.	109.9/333.8	2
Teterboro, N. J.	108.1/334.4*	5
Wheeling, W. Va.	109.9/333.8*	2
White Plains, N. Y.	109.7/333.2*	7
Washington (National)	109.9/333.8	2
Washington (International)	109.5/332.6**	3
Worcester, Mass.	108.1/334.4*	5
Second Region		
Albany, Ga.	109.9/333.8**	2
Brunswick, Ga.	109.5/332.6**	3
Chattanooga, Tenn.	109.5/332.6*	3
Orlando, Fla.	109.9/333.8*	2
Raleigh, N. C.	108.3/335.0*	4
Spartanburg, S. C.	109.9/333.8**	2
Third Region		
Akron, Ohio (Akron-Canton)	108.1/334.4*	5
Detroit, Mich. (Wayne-Major)	108.1/334.4**	5
Lansing, Mich.	108.3/335.0*	4
Minneapolis, Minn.	110.3/335.0*	1
Rochester, Minn.	109.5/332.6**	3
Fourth Region		
Big Springs, Texas	109.9/333.8**	2
Fort Worth, Texas (International)	109.5/332.6**	3
Laredo, Texas	110.3/335.0**	1
Fifth and Sixth Regions (no change in Seventh)		
Sioux City, Iowa	109.9/333.8**	2
Ontario, Calif.	108.1/334.4*	5
San Diego, Calif.	108.3/335.0*	4
Santa Barbara, Calif.	108.3/335.0*	4

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Businessman, Lester Skinner, President of Skinner Salted Nuts, Bergenfield, N. J. learned to fly a Pacer last fall, had his license four weeks later. He finds his new Tri-Pacer "less expensive to run than a car . . . a great asset to my business."

Flying Ease and Economy of Operation Produce—

Across the Atlantic to Switzerland and back plus a nonstop flight from Los Angeles to New York! That's why Max Conrad of Minneapolis says, "The Piper Pacer is a remarkable cross-country airplane with economy and dependability which makes it ideal for farm or business."

"Easiest plane to fly I've ever owned," says LeRoy Getting, prominent cattleman of Sanborn, Ia., shown here with Mrs. Getting. Like many farmers and ranchers, Mr. Getting prefers the Pacer's economy of operation, load-carrying ability and easy, restful flight characteristics.

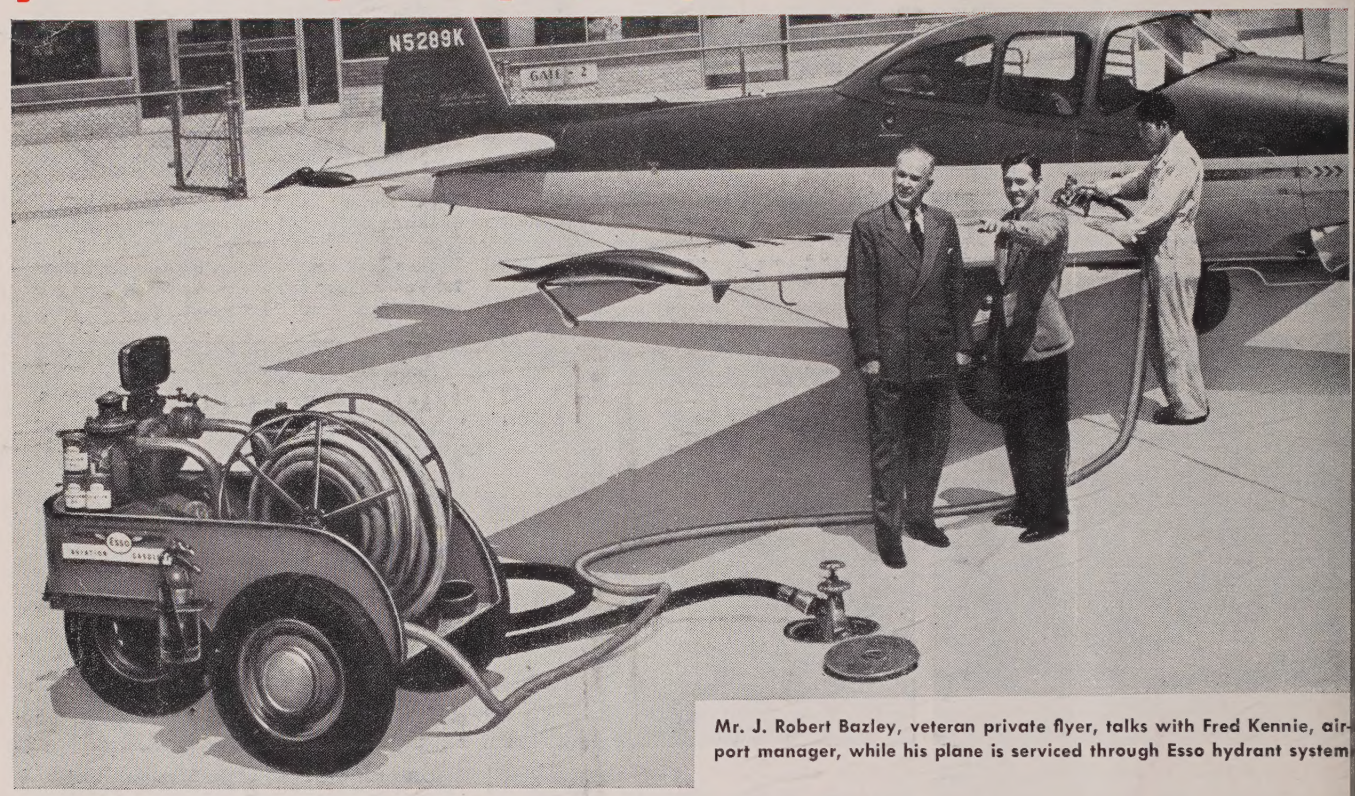
Winner of three major European efficiency races, the Piper Pacer outclassed all other types of personal aircraft. Flown by R. E. A. Goemans of Paris (second from left) the Pacer led field of 55 planes at the International Air Rally of Paris; won also at Champagne and Angers.

Hundreds of Enthusiastic Pilot Comments

Talk to any Piper Pacer owner and you get enthusiastic reports on speed, comfort, short field ability, and flying ease all combined with unbelievable economy. Price-wise, performance-wise, there's nothing to compare with this remarkable cross-country airplane. And in the Pacer or Tri-Pacer you get these important exclusives—nonflammable Duraclad finish, the dependable Lycoming 125 hp engine, and separate front and rear doors. Take a demonstration flight and see for yourself. For free Pacer brochure write Dept. K10.

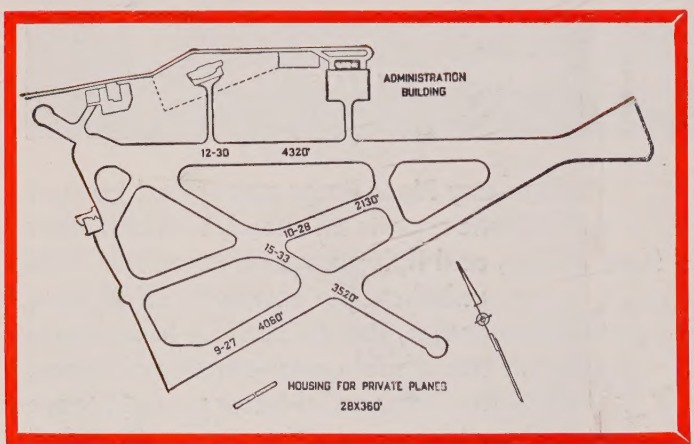
PIPER AIRCRAFT CORPORATION
Lock Haven, Pennsylvania

Williamsport's modern municipal airport provides prompt, dependable service...



Mr. J. Robert Bazley, veteran private flyer, talks with Fred Kennie, airport manager, while his plane is serviced through Esso hydrant system

with Esso Aviation Products...



THE WILLIAMSPORT, PENNSYLVANIA, MUNICIPAL AIRPORT

Located four miles from the city this modern airport is served by three major airline networks TWA, Capitol, and All American. There are complete servicing facilities and a flight school. The field also has two approved repair stations.

Covering 227 acres this airport has an elevation of 529 feet above sea level. There are two lighted, concrete runways 4320 and 4060 feet in length with two additional black-top runways of 3520 and 2130 feet. The field is lighted.

The new Administration Building has 15000 feet of floor space and houses airline passenger, airmail, freight and express facilities, and a complete restaurant. The Interstate Airway Communications (call letters IPT) and the United States Weather Bureau also maintain stations in this building.

Mr. Bazley, pictured above at the new Williamsport Administration Building, has been an Esso user for nearly 20 years. In addition to having his plane serviced with Esso Aviation Products, Mr. Bazley, as one of the country's largest anthracite stripping and highway contractors, uses Esso Products exclusively for his trucks and other machinery. In the skyway or on the highway, Mr. Bazley knows he can depend on the products that carry the Esso trade-mark.

ESSO AVIATION PRODUCTS offer high quality, backed by the constant research of America's largest petroleum laboratory. Servicing one private plane or a whole fleet of commercial airliners... the products sold at the famous Esso Sign help maintain highest operating efficiency... keep 'em flying!

Esso

AVIATION PRODUCTS

SOLD IN: Maine, N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Penna., Ohio, Del., Md., D. C., Va., W. Va., Ky., N. C., S. C., Ga., Fla., Ala., Miss., Tenn., Ark., La., Texas.